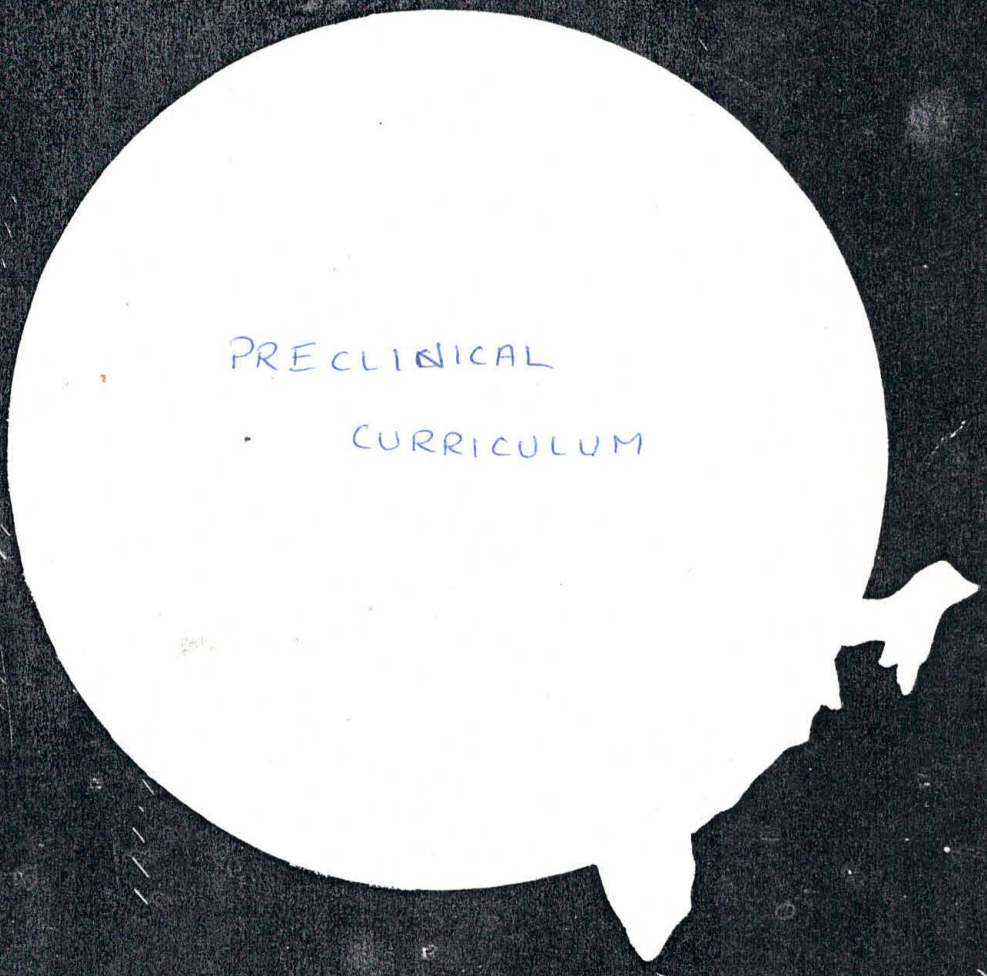
INQUIRY-DRIVEN STRATEGIES FOR INNOVATION IN MEDICAL EDUCATION IN INDIA

CURRICULAR REFORMS



The CONSORTIUM of Medical Institutions
for reform of Medical Education in India

WHO-SEARO Project IND-HMD 017/G
SE/IND HRH 001/RB 92

EDITORIAL COMMITTEE

RESOURCE FACULTY

Special Invitees:

Dr. Mohan Garg
DME - UIC
Chicago, US

Dr. S. D. Sharma (ADG)
DGHS, Nirman Bhavan
New Delhi

Dr. Palitha Abeykoon
Medical Officer, (Med. Edu.)
WHO-SEARO
New Delhi

Dr. Aung Than Batu
Director (HRH)
WHO-SEARO
New Delhi

Dr. D. B. Bisht
WHO-SEARO
New Delhi

Dr. Swarana Bhardwaj
Executive Director
National Board of Examinations
New Delhi

Dr. A. Krishna Rao
Prof. of Medical Edu.
The Kasturba Medical College
Manipal

Dr. K. P. Puthuraya
Prof. of Physiology
Bangalore Medical College
Bangalore

Dr. Chandrama Anand
Principal
L. H. M. C.
New Delhi

A. I. I. M. S., New Delhi

Dr. S. K. Kacker
Director

Dr. L. M. Nath
Prof. Comm. Med.

Dr. Usha Nayar
Prof. of Physiology

Dr. Kusum Verma
Prof. of Pathology

Dr. Veena Bijlani
Prof. of Anatomy

Dr. G. Gopinath
Prof. of Anatomy

Dr. Bir Singh
Assoc. Prof. Comm. Med.

Dr. Ashok Rattan
Assoc. Prof. Microbiology

Prof. Meharban Singh
Prof. of Pediatrics

Dr. Ramesh Kumar
Prof. Microbiology

Dr. A. N. Malaviya
Prof. of Medicine

Dr. L. K. Sharma
Prof of Surgery

Dr. S. N. Mehta
Prof. of Surgery

Dr. S. Bal
Asst. Prof. Surgery

Dr. P. K. Dave
Prof. of Orthopedics

Dr. Vinod Paul
Assoc. Prof. Paediatrics

Dr. Rita Sood
Assoc. Prof. Medicine

Dr. K. Buckshee
Prof. of Obst. & Gynae

Dr. D. Takkar
Prof. of Obst. & Gynae

Dr. Arvind Jayaswal
Assoc. Prof. Orthopedics

B. V. Adkoli
Educationist, CMET

Institute of Medical Sciences
B. H. U., Varanasi

Dr. N. N. Khanna
Director, IMS-BHU

Dr. V. P. Singh
Prof. of Medicine

Dr. S. S. Gambhir
Prof. of Pharmacology

Dr. P. K. Dey
Dept. of Physiology

Dr. Y. N. Gupta
Prof. of Pathology

Dr. A. M. Tripathi
Prof. of Paediatrics

Dr. K. K. Tripathi
Reader in Medicine

Dr. Anand Kumar
Reader in Surgery

Dr. V. M. Gupta
Prof. of P & SM

Dr. S. C. Mohapatra
Reader in P & SM

C. M. C., Vellore

Dr. Booshanam V. Moses
Principal & Prof. of Surg.

Dr. Abraham Joseph
Prof. of Comm. Med.

Dr. Molly Thomas
Vice Principal
Prof. of Pharmacology

Dr. Ashok Chacko
Addl. Vice Principal
Prof. of Gastro.

Dr. Mary V. Jesudason
Addl. Vice Principal
Prof. of Microbiology

Dr. Alka Ganesh
Prof. of Medicine

Dr. Sulochana Abraham
Prof. of Comm. Medicine

Dr. Chellam Kirubakaram
Prof. of Paediatrics

Dr. M. K. Lalitha
Prof. of Microbiology

Dr. Grace Chandi
Prof. of Anatomy

J. I. P. M. E. R., Pondicherry

Dr. D. S. Dubey
Director

Dr. D. K. Srinivasa
Prof. of P & SM.

Dr. A. J. Veliath
Medical Superintendent

Dr. Asha Oumachigui
Prof. of Obst. & Gynae.

Dr. N. Ananthakrishnan
Prof. of Surgery

Dr. K. R. Sethuraman
Prof. of Medicine

Dr. K. M. Rajendran
Prof. of Anaesthesia

Dr. D. K. Patro
Assoc. Prof. of Ortho.

Dr. D. P. Thombre
Prof. of Physiology

Dr. PH Ananthanarayanan
Prof. of Biochemistry

Dr. C. H. Shashindran
Prof. of Pharmacology

Dr. S. Robinson Smile
Assoc. Prof. of Surgery

Dr. S. Laksmanan
Prof. of Anatomy

Dr. Sudha Rao
Prof. of Anatomy

Dr. B. D. Bhatia
Prof. of Pediatrics

Dr. Vasudev Ananad Rao
Prof. of Ophthalmology

Dr. M. G. Sridhar
Asstt. Prof., Biochemistry

Dr. R. Narasimhan
Prof. Pathology

Dr. Jayanthi
Assoc. Prof. of Pathology

Dr. S. M. Sharif
Prof. of Forensic Medicine

Dr. K. D. Tripathi
Prof. of Pharmacology

G. R. Medical College, Gwalior

Dr. A. K. Govila
Dean, GRMC

Dr. M. K. Gupta
Ag. Dean

Dr. K. C. Sharma
Dean and Prof. of Surgery

Dr. Ravi Raman
Prof. of Medicine

Dr. J. S. Chabra
Professor

Dr. N. N. Laha
Professor

Dr. P. C. Mahajan
Prof. of Prev. & Social Med.

S. P. Saxena
Deptt. of Physiology

Dr. N. Trikha
Deptt. of Pathology

Dr. Mrs. S. Sapre
Prof. of Obst. & Gynae.

Dr. (Mrs.) R. K. Taluja
Prof. of Paediatrics

Dr. S. R. Agarwal
Deptt. of ENT

Dr. K. L. Saraf
Prof. of Surgery

Dr. S. Kapoor
Deptt. of Medicine

Dr. P. S. Tonpay
Deptt. of Physiology

S. C. B. Medical College, Cuttack

Dr. S. C. Patnaik
Prof. of Cardiothoracic Surgery
Principal, SCBMC

Dr. P. T. Rao
Prof. of Orthopedics

Dr. K. K. Mishra
Prof. of Medicine

Dr. S. N. Tripathi
Deptt. of Obst. Gynae.

Dr. H. B. Mohapatra
Prof. of Social & Prev. Med.

Dr. K. C. Biswal
Prof. of Physiology

Dr. B. Sarangi
Prof. of Medicine

Dr. (Mrs.) H. L. Swain
Prof. of Obst. & Gynae.

Dr. Bhagyadhar Swain
Prof. of E.N.T.

Dr. Surekha Devi
Asstt. Prof. Physiology

Dr. R. N. Mallick
Prof. of Pathology

Dr. N. C. Padhi
Deptt. of Surgery

Dr. R. Panigrahi
Deptt. of Obst. Gyane

Dr. K. C. Behera
Deptt. of Pathology

Siddhartha Medical College Vijayawada, A. P.

Dr. TMV Prasada Rao
Principal, SMC

Dr. (Mrs.) G. Venkata Ratnam
Prof. of Pathology

Vice Principal
Dr. N. S. Das
Prof. of Biochemistry

Dr. Sree Rama Rao
Prof. of Microbiology

Dr. TSS Manidhar
Asstt. Prof. of P & SM

Dr. Anjaneyalu
Prof. of Medicine

Dr. A. Aswini Kumar
Prof. of Medicine

Dr. S. Narasimha Reddy
Prof. of Comm. Medicine

Dr. C. Shobha Rani
Asst. Prof. of Physiology

Dr. K. Jayalakshmi
Prof. of Obst. & Gynae.

St. John's Medical College Bangalore

Dr. A. F. A. Mascarenhas
Principal

Dr. Mary Ollapalloy
Vice Principal

Dr. Chitra Stephen
Coordinator, MEC

Dr. Prem Pais
Prof. of Medicine

Dr. Nandakumar Jairam
Prof. of Surgery

Dr. R. Narayanan
Prof. of Obst. Gynae.

Dr. Sayee Rajangam
Prof. of Anatomy

Dr. Ragini Macaden
Prof. of Microbiology

Dr. Dara S. Amar
Prof. of Community Health

Students' Representatives
(From CMC, Vellore)

Ms. Priya Abraham
Ms. Indu Koshy
Sowmya Satyendra
Mr. Sanjay Murala
Mr Sanjeev Maskara

Acknowledgments

The editors wish to acknowledge the support received from the Government of India, Ministry of Health & Family Welfare in recommending this project for WHO support. But for the financial support received from WHO-SEARO, this publication would not have seen the light of the day. Though many officials in the WHO-SEARO have been supportive in our ventures, Dr. Palitha Abeykoon deserves special mention for his guidance and keen interest throughout this project. Dr. Mohan Garg from DME-UIC, USA has been instrumental in germinating the idea and guiding the deliberations of the consortium right from its inception. We owe him a tremendous debt of gratitude.

It is not possible to mention the individual contributions made by a large number of faculty members belonging to eight consortium institutions and their Deans/Principals. We thank them profusely for their contribution.

Our special thanks are due to Mrs. Chander Kanta for the secretarial assistance and Print Tech., New Delhi for designing and printing in a short time.

Editors

FOREWORD

The need for reorienting medical education in line with the health needs of the society is a matter of global concern, though the nature of changes envisaged by different countries, and the strategies contemplated for bringing about those changes, might vary considerably. Towards this end, restructuring undergraduate curriculum is an intervention which is invaluable and inevitable. The deliberations of a consortium of eight medical schools in India, who addressed the question of curricular reforms, by adopting an inquiry-driven strategy, is a testimony to the growing belief that a change 'is' possible, and there are several ways to bring about this change.

The concern for introducing changes in medical education has emerged from extramural factors as well as pressures from within the profession itself. The change in the demographic profile of countries, especially the increase in the aging population, degrading environment, population explosion resulting in diseases of poverty, emergence of new diseases including AIDS, resurgence of old diseases, childhood afflictions, growing immigration from developing to developed countries owing to globalization and free market economies, technological revolution resulting in urbanization and the resultant stress and diseases of affluence have all contributed to a new health situation to which medical education must respond urgently.

Within the medical profession the continuing explosion of scientific knowledge is the greatest challenge to the already over crowded curriculum with multiplicity of subjects and narrow specialities competing for curricular time. In some cases bureaucratic controls have restricted the autonomy of medical schools to innovate and change. The continuing growth in high technology has tended to erode the human touch resulting in a new ethical dilemma which should be addressed in the educational system.

Nevertheless, the medical education system all over the world has responded to some of these challenges. As early as in 1910, Abraham Flexner's report resulted in the separation of basic sciences from clinical teaching, and laid the foundation for the emergence of new departments. The next wave of changes began after the Second World War which prompted some medical schools to search for alternate tracks and educational strategies marked by student- centered learning and problem-based learning approaches.

WHO has always been in the forefront while taking initiatives to support health manpower development across the globe. Through its pioneering work of establishing a network of Regional and National Teacher Training Centres (RTTCs and NTTCs), and promoting fellowship and exchange programmes, WHO has facilitated the application of

educational science and has focused on the need to view medical education in the broader perspective of health care delivery.

The 1978 Alma Ata declaration of HFA/2000 through PHC is a major initiative to place medical education in the broader context of health delivery system. It became apparent that educational reforms must take into account the structure and requirements of the national health care delivery system, health problems prevalent in the region as well as the constraints of the medical profession besides student characteristics.

The Agenda for Action, launched by WHO in 1991, underlines three components, viz. setting standards, developing tools for assessment, and identifying appropriate strategies for change and follow-up through worldwide monitoring. The South East Asia Regional Office of WHO has, to its credit, the distinction of having arranged regional consultations on reorientation of Medical Education and bringing out a series of related publications.

There are other major players in medical education, viz. the World Federation of Medical Education (WFME) which proclaimed the Edinburgh Declaration in 1988 and organized the World Summit on Medical Education in 1993, and the Network of Community-oriented Health Institutions, besides leading centres in medical education in the USA, UK and Australia.

India, having one of the largest network of health care infrastructure and a pool of health personnel in the world, has been debating the issue of relevance and quality of medical education from time to time since the constitution of the Bhore Committee in 1946. Several organizations such as the Indian Association for the Advancement of Medical Education and the Medical Council of India, besides the Ministry of Health and Family Welfare, have grappled with the issue of making medical education more need based and task-oriented.

However, the work of the consortium of medical institutions to reform medical education can be singled out as a significant landmark, as it is based on a systematic inquiry-driven approach. It is pertinent to note how the strategies proposed by WHO for global action are being implemented by the institutes forming part of the consortium. The principle of attaining a common goal by collective effort utilizing a common protocol is a fascinating example of how to achieve **optimum utilization of resources.** Deliberations based on inter-institutional dialogue and liaison with other bodies such as the Medical Council of India would enable the building of a **national consensus.** The inquiry-driven strategy implies collection of a comprehensive database on the health situation and health needs, which will provide a **population perspective** to the curriculum planning exercise. The integrated teaching modules suggested in this work are based on **important public**

health problems of India or common conditions such as tuberculosis, AIDS, mother and child health care, cardio-pulmonary resuscitation, first aid, etc.

The modular approach is also found to be a very effective educational intervention for reducing the curriculum burden and promoting self-paced learning. The courses proposed in the curriculum, viz. behavioural science and medical ethics, are an attempt to fill the gap of psychosocial and humanistic aspects of care which are found lacking in the present curriculum. The concept of essential skills and core curriculum lays a solid foundation for a competency-based model which could be extended as an **experimental track.**

The consortium has plans to delineate an assessment strategy that will encourage **problem-solving orientation,** which is another strategy which has high feasibility as against grafting PBL approach in a traditional medical school.

The consortium has already constituted several task forces to work out a detailed teaching/learning methodology, produce of learning materials on thrust areas, develop assessment strategies, promote on-going health system research (HSR) and disseminate information to all medical schools in the country.

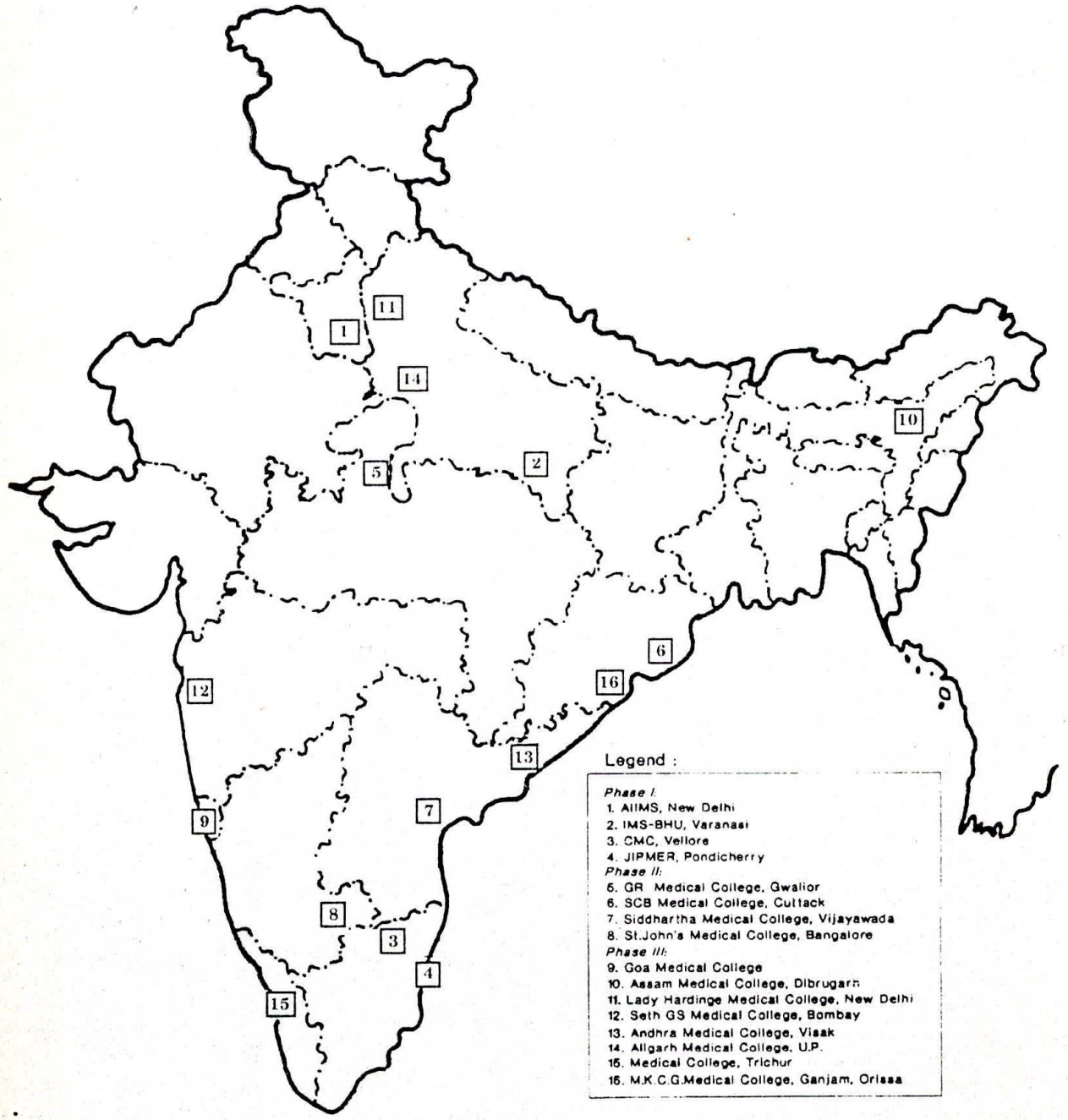
Thus, with a strong base of R&D activities built into the system, and with concerted inter-institutional efforts, the deliberations of the consortium of medical schools will be keenly watched, not only in the Indian sub-continent but also in other countries of the South East Asia Region and elsewhere.

January, 1995
New Delhi

Dr. Uton Muchtar Rafei
Regional Director
World Health Organization
South East Asia Region

Consortium of Institutions

Phase-II



across the consortium institutions. As such, it is extremely difficult to capture the authenticity and accuracy of the information and views often divergent emanating from diverse groups. Nevertheless, what is presented in this monograph is a consensus and collective view of selected brains. We fully believe that any exercise in delineating the curriculum is an evolving process which needs scrutiny, review and update from time to time.

A point of clarification on the sanctity of this work may be necessary. The onus of laying down the undergraduate curriculum rests on the Medical Council of India, which has initiated several activities in the recent past including a curriculum document. MCI has officially recognised "the consortium" for collaboration in curricular development and Teachers Training. What consortium has attempted is to delineate the undergraduate curriculum into two tiers viz, what an undergraduate 'must know' and what is 'desirable to know'. This we hope, is a useful strategy to cope with the every increasing curriculum load.

The list of 'essential skills' provide a basis for organizing teaching learning activities which are task oriented and competence based. The thirteen integrated teaching modules provide a basic framework for promoting both horizontal and vertical integration, a recommendation which is strongly voiced by the MCI and others. Besides a national health perspective has been added to it by choosing needbased topics.

We are aware of our limitations. We cannot call a curriculum document as 'complete' unless we have a teaching learning methodology and an assessment strategy built into it. The consortium has already constituted several taskforces to look into some of these issues. However, with a sense of humility, we would like to set the ball in motion, so that we have some thing to discuss and debate. The following quote should sum up what we wish to express.

"Look, this is what some of us have collectively arrived at. You may not totally agree with us. But we would like to work together for, we have a common concern."

S.K. Kacker
Director
AIIMS

Introduction

Eight years ago, to be more precise in November, 1986, a group of motivated medical educationists representing four medical colleges in India in collaboration with the Department of Medical Education, University of Illinois, Chicago (DME-UIC) met at New Delhi. All of them had a common concern of restructuring the medical education in tune with the health care needs of the country. Learning from the lessons learnt in the past, they resolved to address the issue by adopting an Inquiry-Driven Strategy - a strategy based on actual database resulting from an extensive inquiry. It was also decided to adopt a common protocol for initiating a co-ordinated and collective action. This marked the beginning of a consortium of medical institutions for reform of medical education. During the first phase (1989-90) the four institutions generated extensive data base, identified curricular deficiencies and proposed certain innovations. The findings of these deliberations were presented at a National Conference held at AIIMS in April, 1990 to a wider audience consisting of consortium institutions,. Deans of selected medical colleges, besides representatives from Ministry of Health, Medical Council of India, and WHO-SEARO. The proceedings resulted in a monograph entitled "Inquiry-Driven Strategies for Innovation in Medical Education in India", popularly called 'green book'.

The April, 1990 conference unanimously recommended the adoption of Inquiry Driven Strategy and enlargement of the consortium to spread the message to a larger number of medical colleges on a regional basis. Thanks to the approval given by the Government of India and financial assistance from the WHO-SEARO, the consortium could embark upon a second phase with more intensified activities.

During the second phase the consortium institutions deliberated on five main issues, viz, developing a list of essential skills to be performed by an MBBS doctor; a core curriculum which identified what a student 'must know' and what is 'desirable to know'; a set of integrated teaching modules on need based topics; a course on behavioural sciences; and medical ethics. What is presented in this monograph is essentially an extract from the deliberations made by eight consortium institutes on these issues, over a period of three years.

It is important to realize that the deliberations were made at different point in time, by several groups both disciplinary and inter-disciplinary, spread

UNDERGRADUATE MEDICAL EDUCATION

INSTITUTIONAL GOALS AND OBJECTIVES

INSTITUTIONAL GOALS :

The teaching and training during MBBS course will equip the undergraduate to provide health care appropriate to his/her position in the health team to an individual and community in health and sickness.

Objectives :

At the end of the teaching/training the undergraduate will be able to :

Diagnose and manage common health problems of the individual and the community appropriate to his/her position as a member of the health team at primary, secondary and tertiary levels.

Be competent to practise curative, preventive, promotive and rehabilitative medicine and understand the concepts of primary health care.

Understand the importance and implementation of the National Health Programmes in the context of the national priorities.

Understand the socio-psychological, cultural, economic and environmental factors affecting health and develop **humane attitude** required for professional responsibilities.

Develop the ability for continued self learning with a scientific attitude of mind and acquire further expertise in any chosen area of medicine.

List of Skills for MBBS Graduate

At the end of an undergraduate training programme in a medical college, it is expected that the doctor will be able to:

I. CLINICAL

*1. Obtain a proper relevant history, perform a humane and thorough clinical examination including internal examinations (per-rectal, per-vaginal) and examinations of all organs/systems in adults and children including neonates.

*2. Do psychiatric evaluation and recognise common psychiatric illnesses.

*3. Use the Stethoscope, B.P.Apparatus, Auroscope, Thermometer, Nasal Speculum, Tongue depressor, Weighing scales, vaginal Speculum. Percussion hammer, measuring tape, proctoscope, tuning fork and head mirror.

*4. Arrive at a logical working diagnosis after clinical examination.

*5. Order appropriate investigations keeping in mind their relevance (need based) and cost effectiveness.

*6. Plan and institute a line of treatment which is need based, cost effective and appropriate for common ailments taking into consideration:

a. Patient,
b. Disease,
c. Socio-economic status,
d. Institutional/governmental guidelines.

7. Recognise situations which call for urgent or early treatment at secondary and tertiary centres and make a prompt referral of such patients after giving first aid or emergency treatment.

8. Monitor growth and development of children and differentiate normal from abnormal.

9. Assess severity of dehydration.

10. Assess and manage fluid/electrolyte and acid-base imbalance.

11. Detect and institute corrective measures for nutritional deficiencies.

*12. Determine gestational age.

*13. Demonstrate surface marking of common superficial arteries, veins, nerves and viscera.

II. INTERPRETIVE

*1. Interpret abnormal biochemical laboratory values of common diseases.

*2. Interpret skiagrams of common diseases.

3. Identify irrational prescriptions and explain their irrationality.

*4. Interpret serological tests such as VDRL, ASLO, Widal, HIV, Rheumatoid factor, Hepatitis and TORCH infections.

5. Interpret antimicrobial sensitivity reports.

6. Interpret peripheral smear of common diseases.

III. ETHICAL AND AFFECTIVE

1. Demonstrate empathy and humane approach towards patients, relatives and attendants.

2. Demonstrate interpersonal and communication skills befitting a physician in order to discuss the illness and its outcome with patient and family.

3. Develop a proper attitude towards patients, colleagues and other staff.

4. Maintain an ethical behaviour in all aspects of medical practice.

5. Develop a holistic attitude towards medicine taking in social and cultural factors in each case.

6. Keep patients' welfare foremost to provide quality care as well as avoid consumer initiated legal problems.

7. Obtain informed consent for any examination/procedure.

8. Appreciate patients' right to privacy.

9. Motivate colleagues, community and patients to participate actively in national health programmes.

10. Motivate people regarding desirability of blood and organ donation and autopsies.

11. Develop a positive attitude to pursue self directed learning to continuously keep abreast of advances and also motivate colleagues to do the same.

IV. COMMUNICATION

*1. Write a complete case record with all necessary details.

2. Write a proper discharge summary with all relevant information.

3. Write a proper referral note to secondary or tertiary centres or to other physicians with all necessary details.

4. Assess the need for and issue proper medical certificates to patients for various purposes.

5. Establish rapport and talk to patients, relatives and community regarding all aspects of medical care and disease.

V. MANAGERIAL

1. Provide leadership to a medical team and promote team spirit in time of :

   a. Disasters
   b. Mass casualties
   c. Organizing health programmes.

2. Organise antenatal, postnatal, well-baby and other clinics.

3. Organise and give training in first aid.

4. Plan and manage health camps such as family welfare camp.

*5. Adopt universal precautions for self protection against HIV and hepatitis and counsel pateints.

6. Organise and carry out investigation of an epidemic and institute corrective/preventive measures.

7. Manage stores, indenting and stock keeping relevant to managing a primary health centre or a general practice set up.

8. Maintain cold chain for vaccines.

9. Collect, present and report vital health statistics with special reference to national health programmes.

VI. MEDICO-LEGAL

1. Examine and prepare proper certificates in the following medico-legal situations:

   a. Injured patient.
   b. Sexual offences.
   c. Determination of age.
   d. Intoxicated patient.

2. Prepare proper certificates of birth and death.

3. Record dying declaration.

4. Give evidence in a court of law as an expert witness.

5. Collect and do proper labelling, preservation and despatch of medico-legal specimens.

6. Perform, record findings and issue a report for a medico legal autopsy.

VII. LABORATORY

1. Be able to collect and transport materials for various pathological tests including histopathology, cytopathology, microbiology and biochemistry.

*2. Do complete urine examination including microscopy.

*3. Do and interpret HB, TLC, DLC, ESR, PCV, BT, CT and blood smear for parasites and red cell morphology.

4. Do blood grouping and cross matching.

*5. Do stool exam for ova, cysts, and occult blood; and hanging drop for vibrio cholerae.

6. Perform skin scrapings and do a KOH preparation for fungus infections.

7. Do and examine a wet film of vaginal smear for Trichomonas and fungus.

*8. Perform and interpret Gram's stain, Albert's stain, Ziehl-Nielsen or modified Ziehl Nielsen's stain.

9. Do cell counts and gram stain of CSF and other body fluids.

10. Perform skin sensitivity tests for drugs and serum.

11. Perform and read Mantoux test.

12. Prepare slit skin and nasal smear for lepra bacilli.

13. Record and interpret an ECG and be able to identify common abnormalities like myocardial infarction and arrhythmias.

VIII. MANIPULATIVE

1. Start i.v. line and infusion in adults, children and neonates.

2. Do venous cutdown.

*3. Give intradermal / SC/ IM/IV injection.

4. Insert and manage a C.V.P. line.

5. Conduct CPR (Cardiopulmonary resuscitation) and first aid in newborns, children and adults including endotracheal intubation.

6. Pass a nasogastric tube.

7. Pass a stomach tube and do stomach wash.

*8. Administer enemas.

9. Perform vasectomy.

10. Perform circumcision.

11. Perform reduction of paraphimosis.

12. Do Proctoscopy.

13. Do injection and banding of piles.

14. Incise and drain superficial abscesses.

15. Manage superficial wounds and do suturing of superficial wounds and wound toilet.

16. Remove small cutaneous/subcutaneous swellings.

17. Maintain airway (tracheostomy / endotracheal intubation/ cricothyroidostomy).

18. Control external haemorrhage.

19. Apply skin traction.

*20. Apply figure of 8 bandage for fracture clavicle.

*21. Apply POP slabs/casts and splints.

22. Transport safely victims of accidents including those with spinal injury.

23. Reduce colle's fracture.

24. Reduce shoulder dislocation.

25. Reduce tempro-mandibular joint dislocation.

26. Record visual acuity.

27. Examine anterior segment of eye.

28. Remove extraocular foreign body.

29. Incise and drain lid abscess.

30. Perform epilation of cilia.

31. Do lumbar puncture.

32. Do Pleural/peritoneal tap.

33. Aspirate liver abscess.

34. Take a pap smear.

35. Take punch biopsy of cervix.

*36. Conduct normal vaginal delivery.

37. Do artificial rupture of membranes.

38. Perform and suture episiotomies.

39. Apply outlet forceps.

40. Do post partum tubectomy.

41. Perform MTP in the first trimester and be able to do evacuation in incomplete abortion.

42. Insert and remove IUCD.

43. Catheterise bladder in both males and females.

44. Perform syringing of ear.

45. Do nasal packing for epistaxis.

46. Perform nerve blocks like infiltration, digital, pudendal, paracervical, and field block.

47. Prepare ORS.

48. Estimate residual chlorine and chlorine demand for producing safe drinking water.

49. Relieve tension pneumothorax by inserting a needle.

50. Administer O_2 by mask, catheter, O_2 tent and be able to handle O_2 cylinder.

51. Advise dietetic management in different diseases and teach mothers feeding of new borns, infants and children.

52. Implement sterilization and antiseptic measures.

53. Perform extraction of loose teeth.

*54. Insert flatus tube.

IX. EMERGENCY MANAGEMENTS

1. Be able to diagnose and provide emergency management of antepartum and postpartum haemorrhage.

2. Provide first aid to patients with peripheral vascular failure and shock.

3. Manage acute anaphylactic shock.

4. Manage diarrhoeas/dysenteries; Assess dehydration; Prepare and administer oral rehydration therapy (ORT).

5. Manage emergencies of drowning.

6. Manage common poisonings.

7. Manage acute pulmonary oedema and left ventricular failure.

8. Manage acute severe bronchial asthma.

9. Do emergency management of epilepsy and status epilepticus.

10. Do emergency management of comatose patients regarding airway, positioning, prevention of aspiration and injuries.

11. Assess degree of burns and administer emergency management.

12. Manage hyperpyrexia.

NOTE:
Skills marked * to be learned during undergraduate course; Rest to be learnt during internship.

Behavioural Sciences Course

Departmental Objectives :

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

Understand nature and development of different aspects of normal human behaviour like learning, memory, motivation, personality, and intelligence.

Recognize differences between normal and abnormal behaviour.

Understand how psychological and social factors influence man's behaviour throughout his life cycle and how they affect his health and response to illness.

Conduct the clinico-social evaluation of the patient in respect to attributes like socio-economic status; attitude to health and disease and health services.

Establish harmonious doctor-patient relationship.

Communicate effectively with the individual, family and the community.

Possess and utilise the knowledge and skills of behavioural science/techniques for adoption of health practices.

COURSE CONTENTS

I. INTRODUCTION TO TYPES OF BEHAVIOURAL SCIENCES

1. Sociology, psychology, and anthropology relevant to health and disease.

2. Aspects of health economics and management sciences.

II. FAMILY STUDIES

1. Family support system : Role of family in health and disease.

2. Types of families : Structure and functioning; Social problems.

III. ILLNESS AND HEALTH

1. Mores about illness and health.

2. Beliefs, custom, norm.

IV. SOCIO-ECONOMIC STATUS

1. Relationship of socio economic status with health and disease.

2. Measurement of socio economic status.

V. COMMUNICATION SKILLS

1. Interview techniques; Methods of communication with patients and their relatives; Role of communication in interpersonal relationship.

2. Communication medias.

VI. METHODS OF SOCIAL WORK

1. Social case work.

2. Social group work; and Community organisation.

VII. SOCIAL SECURITY

1. Social assistance and social insurance, social security schemes.

VIII. INTRODUCTION TO PSYCHOLOGY

1. Basis of human behaviour.

2. Application of psychology to medicine.

3. Role of nature vs. nurture in shaping human behaviour.

IX. HUMAN DEVELOPMENT : INFANCY TO ADOLESCENCE

1. Stages of development; and Individual differences.

2. Behavioural expectancies and problems.

X. HUMAN DEVELOPMENT : ADULTHOOD TO OLD AGE

1. Development tasks of adulthood and old age; Adjustment problems in old age.

XI. PERSONALITY DEVELOPMENT

1. Types of personality.

2. Premorbid personality and relationship with illness behaviour.

XII. DEATH AND DYING

1. Reactions of terminally ill patient and family.

2. Breaking news of fatal illness/death to the family.

XIII. LEARNING AND CONDITIONING

1. Nature of learning.

2. Performance, role of motivation in learning and methods to make learning effective.

3. Learning of adaptive and maladaptive behaviours.

4. Various learning methods like association, cognitive, verbal, motor and social.

XIV. COGNITIVE PROCESSES

1. Sensory processes: attention, sensation, perception and thinking.

2. Sensory processes and psychopathology.

3. Problem solving, decision making, and communication in thinking process.

4. Salient features of abnormal thinking.

5. Methods of improving memory.

6. Forgetting and its determinants.

7. Thinking process like concept formation and role of language.

XV. EMOTION

1. Relationship of emotions to illness.

2. Development of emotive behaviour and its physiological basis.

XVI. INTELLIGENCE

1. Nature of intelligence.

2. Role of genetic and environmental influences in intelligence.

3. Assessment of intelligence in clinical setting.

4. Growth of intelligence from birth to old age.

XVII. BEHAVIOURAL MEDICINE

1. Behavioural aspects applied to illness.

2. Methods of behavioural treatment for psychosomatic diseases.

XVIII. COPING AND STRESS

1. Different stressors and their effects.

2. Methods of adaptive and maladaptive coping and stress management.

XIX. DOCTOR-PATIENT RELATIONSHIP

1. The doctor-patient relationship.

XX. ILLNESS BEHAVIOUR

1. Tolerance, threshold of pain and sensitivity.

2. Sick role.

3. Role of socio-cultural background in illness behaviour.

XXI. PAIN

1. Psychology and perception of pain.

2. Management of pain by psychological methods.

XXII. PSYCHOLOGICAL METHODS OF TREATMENT

1. Counselling.

XXIII. ATTITUDES

1. Nature and development of attitudes.
2. Theories and methods to change attitudes.
3. Measurement of attitudes.

Methods of Teaching

Lecture, practical work and small group discussions.

Assessment

To be included in psychiatry and community medicine with appropriate weightage.

MEDICAL ETHICS

COURSE CONTENTS

I. INTRODUCTION TO MEDICAL ETHICS

1. What is ethics?
2. What are values and norms?
3. Relationship between being ethical and human fulfilment.
4. How to form a value system in one's personal and professional life?
5. Heternomous ethics and autonomous ethics.
6. Freedom and Personal responsibility.

II. DEFINITION OF MEDICAL ETHICS

1. Difference between medical ethics and bioethics.
2. Major Principles of Medical Ethics-

Beneficence	-	fraternity;
Justice	-	equality;
Self determination(autonomy)	-	liberty.

III. APPROACHES TO MEDICAL ETHICS

a)	Utilitarian	-	Fletcher	- consequences;
b)	Deontological	-	Kant	- duty;
c)	National Law	-	Aquinas	- reason;
d)	Justice	-	Rawls	- equality;
e)	Modified Deonotology	-	Ross	- intuition.

IV. PERSPECTIVES OF MEDICAL ETHICS

1. The Hippocrates oath.
2. Medical Council of India Code of ethics.
3. The Declaration of Helsinki.
4. Nazi doctors and human experimentation.
5. The WHO declaration of Geneva.
6. The Religious Perspective of Ethics.

V. ETHICS OF THE INDIVIDUAL

1. The patient as a person; The right to be respected; Truth and Confidentiality; and The autonomy of decision.

2. The concept of disease, health and healing.

3. The right to health.

4. Ethics of behaviour modification.

5. The physician - patient relationship; Teacher - student relationship; and Peer relationship.

6. Organ donation.

VI. ETHICS OF HUMAN LIFE

1. What is human life:Criteria for distinguishing the human and the non human.

2. Reasons for respecting human life.

3. The beginning of human life. Conception, contraception and Abortion; Prenatal sex-determination.

4. In-Vitro fertilisation (IVF), Artificial insemination by husband (AIH), and Artificial insemination by donor (AID).

5. Genetic Engineering.

6. Surrogate motherhood, Gamete in-vitro fertilisation technique (GIFT), Zygote in vitro fertilisation technique (ZIFT), TOT.

7. Rights of children, psychiatric patients and mentally and physically handicapped persons.

VII. THE FAMILY AND SOCIETY IN MEDICAL ETHICS

1. The ethics of human sexuality.

2. Family Planning perspectives.

3. Prolongation of life; Euthanasia - society's perspective.

4. Cancer and terminal care.

VIII. DEATH AND DYING

1. Use of life-support systems.

2. Death awareness; The moment of death.

Prolongation of life : ordinary and extraordinary life support.

3. Advanced life directives - The living will; Euthanasia : passive and active.

4. Suicide : The ethical outlook.

5. The right to die with dignity.

IX. PROFESSIONAL ETHICS

1. Contract and confidentiality.

2. Charging of fees; Fee splitting.

3. Prescription of drugs; Over investigating the patient; Unnecessary referrals and patient sharing. Low cost drugs, vitamins and tonics.

4. Allocation of resources in health care.

X. RESEARCH ETHICS

1. Animal and experimental research/humaneness.

2. Human experimentation. Human volunteer research : informed consent.

3. Drug trials.

4. Authorship.

XI. ETHICAL WORKUP OF CASES

1. Gathering all scientific factors; all human factors; all value factors.

2. Identify areas of value - conflict. Setting of priorities.

3. Working out criteria towards decisions.

TEACHING LEARNING METHODOLOGY

- Although many of these topics might be covered in Forensic medicine , but purpose of this course is to make impact on students.
- It should have least number of lectures. Teaching to be preferably by case examples / case discussion and role model.
- To be administered in final year MBBS course by a group of faculty drawn from a number of departments with one of them acting as coordinator.
- Assessment of course to be built into assessment of clinical subjects either as short case or viva-voce or OSCE station. It may be part of internal assessment or of final professional examination.

ANATOMY

Departmental Objectives :

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

Comprehend the normal disposition, inter-relationships, functional and applied anatomy of the various structures in the body.

Identify the microscopic structure of various organs and tissues and correlate the structure with the functions as a prerequisite for understanding the altered state in various disease processes.

Comprehend the basic structure and connections of the central nervous system to analyse the integrative and regulative functions of the organs and systems. He/She should be able to locate the site of gross lesions according to the deficits encountered.

Demonstrate knowledge of the basic principles of embryology including genetic inheritance and sequential development of the organs and systems, recognise the critical stages of development and the effects of common teratogens, genetic mutations and environmental hazards. He/She should be able to explain the developmental basis of the major variations and abnormalities.

COURSE CONTENTS

I. GENERAL EMBRYOLOGY

1. Definition of embryology; gestation period: subdivisions; definition of gonads: testis, ovary; definition of gamete: sperm, ovum; gametogenesis, migration of primordial germ cells into gonadal ridge; spermatogenesis; structure of sperm, oogenesis; structure of ovum; growth of ovarian follicles, ovarian and uterine cycles.

2. Sperm in the male genital tract; sperm in the female genital tract; activation and capacitation of sperm in the female genital tract.

First week of Development

3. Definition and process of fertilisation, formation of Zygote; cleavage division; formation of morula and blastocyst; implantation; formation of decidua - its subdivisions. Types of implantation and abnormal sites of implantation.

Second week of Development

4. Differentiation of embryoblast and trophoblast; changes in the embryoblast - bilaminar germ disc; changes in the trophoblast; formation of cytotrophoblast, syncytiotrophoblast, amniotic membrane, yolk sac, extra embryonic mesoderm and extra embryonic coelom and connecting stalk; formation of chorion, amniotic cavity, primary yolk sac cavity; appearance of prochordal plate.

Third week of Development

5. Appearance of primitive streak and primitive node; formation of intraembryonic mesoderm resulting in trilaminar germ disc; formation of notochord, buccopharyngeal and cloacal membranes, pericardial bar, paraxial, intermediate and lateral plate mesoderm, secondary yolk sac, intraembryonic coelom and allantoic diverticulum; derivatives of ectoderm, endoderm and mesoderm.

Fourth To Eighth week of Development

6. Formation of somites, neural tube, cephalocaudal folding, lateral foldings, body form, stomodeum, proctodeum, gut and vitelline duct; subdivisions of gut into foregut, midgut and hindgut.

Third to Tenth Month of Development

7. Maturation of tissues and organs and rapid growth of body.

8. Estimation of age; horizons of development.

Placenta

9. Formatioin of placenta and chorionic villi; decidua basalis; features and functions of placenta; placental circulation; abnormalities; placental barrier; types of placenta.

Umbilical Cord

10. Formation of umbilical cord; features of umbilical cord.

Amniotic Cavity

11. Amniotic cavity and membrane; amniotic fluid - functions; expansions of amniotic cavity and fusion with chorion; chorion leave with decide capsularis; decidua capsularis with parietalls; obliteration of chorionic and uterine cavities; function of fused foetal membranes to dilate cervical canal.

12. Abnormalities; obliteration of chorionic and uterine cavities; abnormalities of chorion.

13. Formation of twins and types of twins.

14. Arrangement of foetal membranes. Conjoined twins.

Teratology

15. Genetical and environemntal factors as causative factors for congenital malformations.

16. Mode of actions of teratogenes and critical periods.

II. SYSTEMIC EMBRYOLOGY

1. Development of the individual organs of digestive system, genital system, urinary system, respiratory system, cardiovascular system, nervous system, special sensory organs, endocrine glands and mammary gland.

2. Developmental abnormalities; pathogenesis of the anomalies.

3. Histogenesis of various organs.

4. Development of skeletal system, muscular system and derivatives of coelomic cavities.

5. Development of face and the pharyngeal arches and the associated congenital anomalies.

III. OSTEOLOGY

1. Names of the bones of the body and their position; classification of the bones with examples; general features of the bone and normal development; microscopic anatomy of bone; general pattern of blood supply; ossification of the bones of the limbs for age determination.

2. Process of repair of bone.

IV. MUSCULAR SYSTEM

1. Classification and identification of the muscles of the body: main attachments, nerve supply and action; microscopic anatomy of muscles and the nerve terminations.

2. Details of attachments of the muscles; ultrastructural features of muscle; mechanism of the movement caused by the muscle/muscles and various forces exerted by them.

V. ARTHROLOGY

1. Classification of joints, general features of different types of joints; detailed study of major joints of the limbs and movements.

2. Microscopic anatomy of articular cartilage; maintenance of articular cartilages; blood supply and nerve terminals in the articular cartilage.

VI. CARDIO-VASCULAR SYSTEM

1. Position and parts of the heart; names of the blood vessels and their distribution in the body ; mormal development of heart and major blood vessels of the body.

2. Developmental anomalies; valvular defects and their effects; pathogenesis of the anomalies.

VII. RESPIRATORY SYSTEM AND THE ORGANS

1. Position, parts, relations, blood supply, microscopic anatomy, blood air barrier, normal development.

2. Ultrastructure of pulmonary epithelium.

VIII. DIGESTIVE SYSTEM AND THE ORGANS

1. Position, parts, relations, blood supply, nerve supply, normal development, microscopic anatomy; sphincters of the gastrointestinal system.

2. Sphincteric action and mechanism.

IX. GENITO-URINARY SYSTEM AND THE ORGANS

1. Parts, position, relations, blood supply, nerve supply normal development, and microscopic anatomy.

2. Anatomical basis of Family Planning measures.

3. Electron microscopy of renal glomerulus.

X. ENDOCRINE SYSTEM AND INDIVIDUAL ENDOCRINE GLANDS

1. Organs, location, relations, blood supply, nerve supply, microscopic anatomy and normal development

2. Clinical manifestations of common endocrine disorders.

XI. NERVOUS SYSTEM AND ITS COMPONENTS

1. Parts of nervous system, meninges, nerve terminals, neuroglia, myelination, ventricles, motor and sensory pathways, cranial nerves, functional areas, normal development, microscopic anatomy of neurons, motor and sensory cortex and their blood supply.

2. Reticular formation, limbic system, correlation of microscopic anatomy with function, developmental anomalies, anatomical basis of common neurological disorders.

XII. SPECIAL SENSORY ORGANS

1. Gross and Micro Anatomy of eyeball, ear, nose, skin and tongue.

XIII. LYMPHATIC SYSTEM

1. Gross anatomy of the major groups of the lymphnodes of the body and their drainage areas. Gross anatomy of the major lymphatics specially thoracic duct and its tributaries.

XIV. HUMAN GENETICS

1. Nucleus, DNA, chromosomes, classification, karyotype, chromosomal aberrations (Klinefelter and Turner syndrome) and their Prenatal diagnosis.

2. Pedigree chart. Pathogenesis of chromosomal aberrations and their effects, recombinant DNA, genetic inheritance, genetic counselling, inborn errors of metabolism.

Prosected Parts: Perineum including ischio-rectal fossa.

Lower limb: Dissection: Gluteal region, front and back of popliteal fossa and leg.

Prosected Parts: Sole of the foot and joints.

Head & Neck: Dissection: Superficial and deep dissection of face and neck, orbit and eye ball. Submandibular region.

Prosected parts: Temporal and infratemporal fossa, cranial cavity, naso and oropharyngeal regions. Ear, larynx and pharynx.

NERVOUS SYSTEM:

Sections of brain and prosected specimens to demonstrate visual system, auditory and vesibular pathways and major functional areas.

DEMONSTRATIONS:

- Bones
- Brain and spinal cord
- Cross-sectional anatomy
- Radiological Anatomy
- CT and MRI scan.

MICROSCOPIC ANATOMY:

Stained slides of all the tissues and organs.

Electronmicrographs to demonstrate filtration barrier of kidney, alveolar septum, tight junctions of capillaries and such relevant areas.

DEVELOPMENTAL ANATOMY:

- Models to demonstrate various stages of early foetus and different organs development.
- Slides of ovary and tests to show follicles and stages of maturation of spermatozoa; and early chick and pig embryo.

GENETICS:

Demonstration of normal karyotype and common abnormal conditions including banding; Pedigree chart.

SKILLS

1. Demonstrate surface markings of important organs.
2. Localise important pulsations and the structures against which pressure can be applied in case of bleeding from a particular artery.
3. Elicit superficial and deep reflexes.
4. Demonstrate muscle testing and movements at joints.
5. Locate sites for: Lumbar puncture, sternal puncture, pericardial tapping, liver biopsy.
6. Locate veins for venae puncture.
7. Locate the site for emergency tracheostomy.
8. Locate the subcutaneous positions of large nerves.

AREAS FOR INTEGRATED TEACHING

S.No.	Area/subject	Department/s to be involved
1.	Anatomical basis of birth control measures	Obstetrics and Gynaecology; and Surgery
2.	Postnatal growth and development	Pediatrics and Community Medicine.
3.	Antenatal growth and development	Obstetrics and Gyanecology.
4.	Genetic disorders	Various clinical departments.
5.	Neuro-Anatomy	Physiology and Medicine
6.	Kinesiology - movements at various joints.	Orthopedics
7.	Embryological basis of important and common congenital anomalies.	Pediatries, Obst. and Gynaecology.

PHYSIOLOGY

Departmental Objectives :

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

Describe the normal functions of all the organ systems, regulatory mechanisms and interactions of the various organs for well-coordinated total body function.

Assess the relative contribution of each organ system and the principles in the maintenance of the milieu interieur (homeostasis).

Elucidate the physiological aspects of normal growth and development.

Analyse the physiological responses and adaptation to environmental stresses.

Comprehend the physiological principles underlying pathogenesis and treatment of disease.

Correlate knowledge of physiology of human reproductive system in relation to National Family Welfare Programme.

Course Contents

I. GENERAL PHYSIOLOGY

1. Homeostasis, concepts of physiological norms, range and variations, active and passive transports, Relationship between stimulus and response.

2. Structure of cell membrane, resting membrane potentials, cellular receptors, intercellular communications.

3. Physico-chemical properties of cell membrane. Cell inclusions, their functions.

II. BODY FLUIDS, BLOOD

1. Blood Composition, principles of estimation, functions of plasma proteins, cellular elements of blood, their formation and regulation, haemoglobin and functions, jaundice, anaemias and their classification, haemostatic mechanisms, anticoagulants, blood groups, Rh incompatibility, blood transfusion; ESR; Basic mechanisms of immunity with respect to lymphocytes and functions of WBCs. Lymph.

2. Changes in body fluids in disease; Hypoproteinaemia; oedema. Replacement of body fluid loss. Effects of lymphatic obstruction. Functions of thymus, Structure of immunoglobulins, Autoimmunity, AIDS.

III. NERVE AND MUSCLE

1. Classification; electrical, mechanical properties. Mechanism of muscle contraction and its molecular basis. Neuromuscular transmission, thermal changes, oxygen debt, mechanical efficiency. Smooth muscle, electrical and mechanical properties, nerve supply, neuro-transmitters.

2. Effects of denervation on muscle, neuromuscular disorders, investigations for nerve and muscle disorders, details of chemical changes in muscle contraction.

IV. GASTROINTESTINAL TRACT

1. Functional morphology, functions, regulation of secretion of salivary glands, stomach, small intestine and large intestine; regulation of gastrointestinal movements; functions of gall bladder, liver; site of production and action of G.I. hormones; physiological basis of investigating disorders of secretion and motility.

2. Effects of disorders of secretion and motility. Physiological basis of peptic ulcer and achalasia; motility disorders; liver function tests; diarrhoea and its treatment.

V. KIDNEY

1. Functions of different parts of nephron in urine formation. Role of kidney in water and electrolyte balance. Acidification of urine, diuresis, kidney function tests. Juxtaglomerular apparatus; Renin-Angiotensin system. Renal blood flow. Structure and innervation of bladder; micturition, cystometrogram.

2. Mechanism of action of diuretics, renal failure, principles of artificial kidney, disorders of micturition.

VI. SKIN AND BODY TEMPERATURE (ENVIRONMENT)

1. Functional morphology, heat gain and loss mechanisms, role of skin in temperature regulation. Body temperature, Normal values and variations. Hyperthermia, fever, heat stroke, cold injury.

VII. ENDOCRINE GLANDS

(To be integrated with Biochemistry)

1. General principles of regulation of endocrine glands. Hormones, functions, regulation of secretion. Experimental and clinical disorders of anterior and posterior pituitary, thyroid, parathyroid, adrenal cortex, adrenal medulla and endocrine pancreas. Stress and hormones. Physiology of growth.

2. Synthesis and transport of hormones, receptors and blockers. Functions of local hormones; pineal; cellular mechanism of hormonal action, investigation.

VIII. REPRODUCTION

Male Reproduction

1. Regulation and functions of testis, constituents of semen, ejaculation, testicular hormones, puberty.

2. Abnormalities of testicular function, sex determination and differentiation.

Female Reproduction

1. Menstrual cycle; changes in ovary, uterus, cervical mucus, vagina and hormonal regulation. Ovulation and its detection, fertilisation, implantation, physiological changes during pregnancy, parturition, placenta, physiology of lactation, menopause.

2. Foetoplacental unit, composition of milk, colostrum, nutritional needs of mother and child during pregnancy and lactation, investigations for infertility.

Family Planning and Welfare

1. Physiological basis of contraception in males and females, principles of use of oral contraceptives, safe period rhythm and other methods of contraception.

IX. CARDIOVASCULAR SYSTEM

1. Functional anatomy of heart, properties of cardiac muscle; electrical and mechanical changes in cardiac cycle, normal ECG. Cardiac output; measurement in man, physiological variations. Regulatory mechanisms of heart rate and blood pressure. Regional circulations: normal values, measurement and regulation of coronary, cerebral, skin and foetal. Changes in CVS during muscular exercise, postural changes, gravitational forces, hypovolemia, hypoxia and cardiopulmonary resuscitation.

2. Principles of electrocardiography and cardiac catheterisation. Arrhythmias, pathophysiology of cardiac failure, hypertension, valvular disorders.

X. RESPIRATORY SYSTEM

1. Functional anatomy of respiratory system. Mechanics of normal respiration. Lung compliance, alveolar ventilation, ventilation perfusion ratio, oxygen and carbon dioxide transport, Diffusing capacity, Pulmonary function tests, Regulation of respiration, respiratory acidosis and alkalosis, pulmonary blood flow. Hypoxia, cyanosis, asphyxia. Respiratory adjustments during muscular exercise, hyperbaric conditions, principles of oxygen therapy, artificial respiration.

2. Hyaline membrane disease. Pathophysiology of obstructive and restrictive disorders. Pulmonary oedema, decompression sickness, hyperbaric oxygen therapy, dyspnoea.

XI. CENTRAL NERVOUS SYSTEM

1. Organization of the central nervous system. Functions and neuronal organization at spinal cord level. Synaptic transmission. Motor and sensory systems and their lesions. Reticular system in brain stem, sleep, wakefulness, EEG waves and physiological changes in EEG. Clinical lesions and experimental sections at spinal cord, brain stem and sub-cortical levels. Physiology of basal ganglia, cerebellum, thalamus, hypothalamus, limbic system, prefrontal lobe and cerebral cortex. Speech and its disorders. Autonomic nervous system. Formation and functions of CSF. Blood brain barrier. Central Neurotransmitters.

2. Evoked potentials. Imaging techniques. Neuroglia. Physiological basis of CNS disorders like Alzheimer's disease, Parkinsonism, Syringomyelia, Tabes dorsalis.

XII. SPECIAL SENSES

Eye

1. Image formation on retina. Errors of refraction, functions of aqueous humour, intra-ocular tension. Mechanisms of accommodation, dark adaptation, pupillary reflexes, functions of retina. Role of visual cortex in perception. optic pathway and lesions. Field of vision. Colour vision.

2. Structure of photoreceptors, generator potentials of rods and cones, electroretinogram.

Auditory Apparatus

1. Functions of tympanic membrane, middle ear, cochlea, auditory receptors and pathway. Deafness and its causes.

2. Audiometry, theories of hearing.

Vestibular Apparatus

1. Division, functions, connections and lesions. Vestibuloocular function, nystagmus.

2. Tests of vestibular functions, mechanism of habituation.

Taste and Smell

1. Receptor, pathways and cortical and limbic areas associated with taste and smell.

2. Disorders of taste and smell perception.

PRACTICALS

The following list of experiments and demonstrations is not exhaustive. Additional experiments can be included as and when feasible and required.

I. HAEMATOLOGY

1. Preparation and staining of blood films; identification of blood cells in a stained film; total and differential leucocyte count; estimation of haemoglobin; fragility of red blood cell; erythrocyte sedimentation rate, haematocrit value; blood grouping; bleeding and clotting time.

2. Laboratory classification of anaemias and determination of absolute indices like MCH, MCHC, MCV, colour index.

3. Methods of blood collection; Arneth count; enumeration of reticulocyte and platelets (demonstration); viscocity of blood (demonstration); blood volume estimation (demonstration); bone marrow smear (demonstration).

II. NEURO-MUSCULAR PHYSIOLOGY

Human

1. Mosso's ergography; effects of prolonged voluntary activity, rest, motivation, fatigue on human muscle contractions and calculation of work done; bicycle ergometry and treadmill, mechanical efficiency of human body.

2. Demonstration of electromyography; velocity of nerve impulse and strength duration curve in humans (demonstration); compound action potential (demonstration).

Experimental

1. Study of laboratory appliances in experimental physiology. Frog's gastrocnemius - sciatic muscle nerve preparation; simple muscle curve; effects of increasing strength of stimuli; effects of temperature; genesis of fatigue; effects of two successive stimuli; genesis of tetanus; effect of afterload and free load on muscle contraction and calculation of work done; velocity of nerve impulse in sciatic nerve of the frog; isometric contraction and determination of resting length.

Smooth Muscle

1. Recording of contraction of frog's rectum; recording of movements of small intestine (rabbit) and effects of ions, drugs, temperature.

III. METABOLISM, BODY TEMPERATURE AND KIDNEY

1. Recording of body temperature and effects of exercise on body temperature.

2. Basal metabolic rate in humans; water excretion test.

IV. ENDOCRINES AND REPRODUCTIVE SYSTEM

1. Demonstration of vaginal smears of rats; identification of the phases of the estrus cycle; pregnancy diagnostic tests; effects of adrenaline, posterior pituitary extract on uterine muscle; examination of semen - sperm count, sperm motility (demonstration); Demonstration of slides showing the proliferative and secretory changes in the endometrium.

V. CARDI0VASCULAR SYSTEM

1. Clinical examination of cardiovascular system. sphygmomanometry: effect of exercise and posture on blood pressure, radial pulse, cold-pressor test. Electrocardiography.

2. Experimental cardiogram: effect of warmth and cold on sinus venosus and ventricle; extra systole and compensatory pause; properties of cardiac muscle effect of acetylcholine, adrenaline, nicotine and atropine on frog heart; perfusuion of blood vessels of frog; perfusion of mammalian heart and effect of drugs on it; perfusion of frog's heart and effect of ions on it.

3. Demonstration : Echocardiography; cardiac output in dogs; record of blood pressure, venous pressure, respiration in animals (dog) and effects of various factors on it; phonocardiogram; effect of passive tilt on B.P.; effect of exercise on hemo-cardio-respiratory system; Cardiac function tests; Cutaneous circulation in man.

VI. RESPIRATORY SYSTEM

1. Pulmonary function tests including spirometry; clinical examinations of respiratory system; stethography; cardiopulmonary resuscitation; respiratory response to exercise.

2. Demonstrations: Compliance and surfactant; Donder's model to demonstrate the mechanism of respiration; Dog/cat: intrapleural and intraoesophageal pressures and the effect of various influences on them; Muller's manoeuver; Collection and analysis of respiratory gases; uses of Douglas bag.

VII. NERVOUS SYSTEM

1. Examination of motor functions, sensory functions and cranial nerves; examination of reflexes of normal subject.

2. EEG, EMG and nerve conduction studies : : sensory and motor, compound action potential: decerebrate rigidity in cat: reaction time; spinal frog and reciprocal innervation; decerebrate frog; examination of autonomic functions.

VIII. SPECIAL SENSES

1. Perimetry, acuity of vision-distant and near; colour vision; tests on smell and taste; tuning fork tests.

2. Principles of ophthalmoscopy and retinoscopy;; audiometry; Purkinje-Samson images.

SKILLS

1. Perform experiments designed for study of physiological phenomena.

2. Interpret experimental/investigative data.

3. Distinguish between normal and abnormal data derived as a result of tests which he/she has performed and observed in the laboratory.

LIST OF TOPICS FOR INTEGRATED TEACHING

1. Endocrine glands : Biochemistry and Medicine

2. Family Planning and Welfare : Anatomy and Obstetrics and Gynaecology.

3. Echocardiography : Cardiology.

4. Basic Life support : Anaesthesiology and Anatomy.

5. Patho Physiology of hypertension - Medicine.

6. Clinical Neurology medicine.

7. Intraocular tension and retinoscopy : Ophthalmology.

8. Audiometry and vestibular tests : Oto-rhino-laryngology.

BIOCHEMISTRY

Departmental Objectives :

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

Describe the molecular and functional organization of a cell.

Delineate structure, function and interrelationships of biomolecules and consequences of deviation from normal.

Summarize the basic and clinical aspects of enzymology and regulation of enzymatic activity.

Describe digestion and assimilation of nutrients and consequences of malnutrition.

Integrate the various aspects of metabolism, and their regualatory pathways.

Describe mechanisms involved in maintenance of body fluid and pH homeostatsis,

Explain the biochemical basis of inherited disorders with their associated sequelae.

Outline the molecular mechanisms of gene expression and regulation, principles of genetic engineering and their application in medicine.

Summarize the molecular concepts of body defence and their application in medicine.

Identify the principles of conventional and specialized laboratory investigations and instrumentation; analysis and interpretation of a given data; the ability to suggest experiments to support theoretical concepts and clinical diagnosis.

Course Contents

I. EUKARYOTIC CELL STRUCTURE

1. Cellular compartments; environment, organization and composition of cells; functional role of cellular organelles and membranes.

II. CARBOHYDRATE CHEMISTRY

1. Definition, classification and nomenclature of mono, di and polysaccharides. Structure of carbohydrates including heteropolysaccharides and glycoproteins.

2. Sialic acids and blood group substances.

III. LIPID CHEMISTRY

1. Definition, classification, nomenclature, biological importance and properties of lipids. Structure and functions of biological membrane, liposomes.

IV. PROTEIN CHEMISTRY

1. Definition, classification and structure of proteins and aminoacids; their classification and properties.

V. STRUCTURE-FUNCTION RELATIONSHIP OF PROTEINS

1. Oxygen transport proteins: Structure and structural basis of physiological functions. Modification of Hemoglobin structure and diseases.

2. Lipoproteins: Structural characteristics, classification and biological importance.

3. Enzymes: key concepts, mechanism of action, regulation of enzyme activity and their importance in health and disease.

4. Vitamins: Definition, classification, occurence, sources, daily requirements, functions, deficiency manifestation of fat soluble and water soluble vitamins. Antivitamins and hypervitaminosis.

5. Collagen structure and function. Isolation of enzymes, lipid peroxidation and overview of antioxidants.

VI. NUCLEIC ACIDS

1. Definition, structural description and functions; transcription of genetic information, translation of genetic code, regulation of genetic expression and protein synthesis.

2. Genetic engineering and its importance, DNA damage and repair, gene therapy.

VII. DIGESTION AND ABSORPTION

1. Mechanism of digestion and absorption of carbohydrates, lipids, proteins and aminoacids and factors influencing digestion and absorption. Role of dietary fibre.

2. Alterations in the mechanism of digestion and absorption.

VIII. INTRODUCTION TO INTERMEDIARY METABOLISM

1. Biological oxidation and generation of energy.

2. Carbohydrates: Metabolism of glucose and glycogen. Interconversion of hexoses, metabolism of fructose and galactose, blood glucose homeostasis, overview of common disorders of carbohydrate metabolism and their clinical significance.

3. Lipids: Metabolism of fats, biosynthesis of fatty acids, triglycerides and phospholipids; oxidation of fatty acids, cholesterol homeostasis, lipoprotein metabolism.

4. Proteins and aminoacids: General catabolism of amino acids; ammonia metabolism. Formation and biological significance of glycine, tryptophan, tyrosine, phenylalanine, histidine, sulphur containing aminoacids. Common inborn errors of aminoacid metabolism.

5. Biosynthesis and degradation of purine and pyrimidine nucleotides and gout.

6. Minerals: metabolism.

7. Energy and nutrition: Calorie requirements, specific dynamic action, BMR; balanced and adequate diet.

8. Outline of detoxication mechanisms in the human body.

9. Acid base balance, blood buffers, regulation of blood PH.

10. Breakdown of hemoglobin, biochemical basis of jaundice, classification and their importance; bile pigments and their importance; overview of biochemical basis of porphyrins.

11. Methods of investigations of intermediary metabolism; phospholipids, lipoproteins, prostaglandins, leucotriene and thromboxanes. Rare disorders related to lipid metabolism and inherited disorders related to aminoacid metabolism. Purine salvage pathways, secondary hyperuricemia, metabolism of chromium, cobalt, selenium and toxicity manifestation. Basic concepts of total parenteral nutrition.

IX. ORGAN FUNCTION TESTS

1. Thyroid, Liver, Stomach, Kidney.

X. ENDOCRINOLOGY

1. Mechanism of action and biochemical functions of insulin, steroids, thyroxine.

2. Biochemical tests of fetal maturity.

XI. IMMUNOLOGY

1. Structure and biochemical function of immune system, characteristics of humoral and cell-mediated immune response, complement system, immunoregulation and application of the immunological techniques.

2. Immunodiagnostic methods.

PRACTICALS

1. Spectroscopic examination of hemoglobin and derivatives.

2. Qualitative analysis of gastric juice and bile; principles of Vandenberg test. Interpretation of gastric analysis with correlation to diseases.

3. Milk : qualitative analysis.

4. Qualitative analysis of normal and abnormal constituents of urine and interpretation of results of such analysis.

5. Principles of colorimetry.

6. Principles of estimation of glucose, urea, creatinine, proteins, bilirubins, calcium, cholesterol and uric acid in blood and interpretation of results.

7. Principles of estimation of urea, creatinine in urine and the interpretation of results.

8. Principles of chromatographic and electrophoretic techniques and interpretation of a chromatogram and electrophoretic pattern of serum proteins.

9. Analysis of clinically important enzymes : Alkaline phophatase, SGOT, SGPT and amylase.

SKILLS

1. Use conventional techniques and instruments to perform biochemical analysis relevant to clinical screening and diagnosis.

2. Analyze and interpret investigative data.

Section - III

We present in this section, a breif note on the modular approach to the curriculum design initiated by the consortium institutes. An outline of thirteen integrated teaching modules on thrust areas is given. What is presented is only a plan and further details need to be worked out in implementing these modules.

TUBERCULOSIS

(AIIMS, New Delhi)

Objectives :

At the end of the unit, the MBBS student should be able to :

1. State the importance of tuberculosis as major health problem of the country and state the magnitude thereof. (LC ; B)

2. Outline the importance of the host, the environment and the agent factors in the epidemiology of tuberculosis. (LC ; A)

3. State common characteristics of Mycobacteria which differentiate it from all other groups of bacteria. (LC ; A)

4. Enumerate all Mycobacteria capable of causing disease in man and place them into respective recognized groups of classification. (LC ; B)

5. Indicate major differences between these Mycobacteria. (LC ; B)

6. Perform Zeihl Nielsen staining (ZNS) on a sputum sample and identify the AFB on bright ground microscopy. (Psy. ; A)

7. Demonstrate familiarity with relevant laboratory procedures other than ZNS for the isolation, identification and antibiotic susceptibility of M. tuberculosis. (LC ; A)

8. Describe the mode of infection, pathogenesis, virulence, role of induced hypersensitivity immunity and genesis of granulomatous reaction in tuberculosis. (LC ; A)

9. List common symptoms, elicit important signs and make clinical diagnosis of pulmonary and extrapulmonary (disseminated, TBM, abdominal, genitourinary, bone and joints, lymphadenopathy) infections in children and adults. (LC ; A)

10. Enumerate differences in the clinical presentation of and recognize the development and morphology (gross and microscopic) of primary, progressive primary, miliary, disseminated, fibrocalcific tuberculosis in lungs and various other organs in immunocompetent and immunocompromized host. (HC ; A)

11. Plan investigations (including micro, path, biochemical, radiologic and Mantoux) in a suspected patient. (HC ; A)

12. Choose the appropriate samples to be collected at various stages of illness and from different sites, for making a laboratory diagnosis. (LC ; A)

13. Carry out a Mantoux test and correctly interpret the result of the test, on a child, (Psy. ; A)

14. Interpret the following specific investigations in the context of tuberculosis infection: (HC ; A)

* AFB staining
* Mantoux test
* CSF : Cells, biochemistry, culture, serology
* Pleural fluid : Gross, microscopic, biochemical, cytology, ZN stain.

15. Describe the radiological features of pulmonary and extrapulmonary infection and interpret chest X-ray for presence of primary, progressive primary, miliary and fibrocalcific lesions. (LC ; A)

16. Describe antitubercular therapy in the following

forms of tuberculosis in children and adults giving dose formulation and duration of therapy: (LC ; A)

* pulmonary
* tuberculin positive school child
* TBM
* adenopathy
* miliary
* disseminated
* bone and joint
* genitourinary

17. Advice adjunct and supportive management to a case. (HC ; A)

18. Recognize cases of tuberculosis which, on the basis of complications/complexity, require opinion of a specialist, or referral to a higher level of care. (HC ; A)

19. Plan investigations of the patient if there is no satisfactory improvement after six months of treatment. (HC ; A)

20. Advice the patient about appropriate steps if the laboratory report indicates isolation of Mycobacteria other than tubercle (MOTT) bacilli. (HC ; B)

21. Analyse the impact of the disease on the individual, the family and social and occupational life and advice measures to ameliorate. (HC ; A)

22. Advice regarding BCG vaccination to a child, administer the vaccine and interpret the take response of the vaccine. (Psy. ; A)

23. Institute management of a pregnant lady, lactating lady as well as a neonate born to such a mother. (HC ; B)

24. Describe the salient features of the National Tuberculosis Control Programme. (LC ; A)

25. Describe the role of medical officer of a P.H.C. in the implementation of the NTP. (LC ; A)

LC = Lower Cognitive Objective
HC = Higher Cognitive Objective
Psy = Psychomotor Objective
A = What Student Must Know
B = What is Good to Know

TEACHING LEARNING ACTIVITIES

Objective	Time	Title	Method	Departments
Day 1				
—	09.00 to 09.30	Questionnaire	—	—
—	09.30 to 10.00	Objectives of workshops	—	—
1	10.00 to 10.30	Magnitude of the problem	Lecture	Medicine
3 to 5	11.00 to 12.00	Genus Mycobacteria	Lecture	Microbiology
8	12.00 to 13.00	Pathogenesis of tuberculosis	Lecture	Pathology
10	14.00 to 18.00	Gross & microscopic pathology	Practical	Pathology
Day 2				
9,10	09.00 to 10.30	Clinical presentation	Seminar	Med, Surg, Paed, Obst & Gynae
15	10.30 to 11.30	Radiological features	Small group	Radiology
13,22	12.00 to 13.00	BCG & mantoux testing	Small group	Paediatrics, Community Medicine
6	14.00 to 18.00	Zeihl Nielsen staining	Practical	Microbiology
Day 3				
2,24,25	0.900 to 10.00	Public health	Lecture	Community Medicine
7,11,12 & 14	10.00 to 11.30	Laboratory diagnosis	Seminar	Med, Path, Micro, Radiology
16 to 21, 23	12.00 to 13.30	Medical management	Seminar	Medicine, Paediatrics, Pharmacology
16 to 21, 23	14.30 to 18.30	Surgical management	Seminar	Surg, Obst & Gynae, Ortho, Comm Med
Day 4				
1,2,9	09.30 to 13.00	Visit to TB hospital	Small group	TB hospital staff, Medicine, Surgery, Paediatrics, Community Medicine

Objective	Time	Title	Method	Departments
13,22	14.00 to 15.00	Mantoux test reading	Snall group	Paediatrics, Community Medicine
	15.00 to 18.00	Case studies	Small group	Med. Paed. Surg. Ortho. Path
Day 5				
1,2,24,25	09.30 to 11.30	Clinico-psycho-social case review	Small group	Community Medicine
	11.30 to 13.30	Case studies	Small group	Med. Paed. Surg. Ortho. Path
	15.00	Valedictory & post-workshop questionnaire		

SUGGESTED ASSESSMENT STRATEGIES

Objective	Suggested	Objective	Suggested test
1	MCQ	13	Practical
2	SAQ	14	Viva-voce
3	MCQ	15	Viva-voce and MCQ
4	MCQ & SAQ	16	MCQ & SAQ
5	MCQ	17	SAQ
6	Practical	18	SAQ
7	MCQ	19	SAQ
8	MCQ & SAQ	20	MCQ
9	Bedside case presentation	21	CPSCR
10	Case study, practical viva-voce and specimen identification	22	Practical
		23	SAQ
11	MCQ	24	ESSAY
12	MCQ	25	ESSAY

MCQ = Multiple Choice Questions
SAQ = Short Answer Questions
CPSCR = Clinico-Psychosocial Case Review

TASKS AHEAD

Section 2 and 3 of this monograph give compilation of the core curriculum, the essential skills, courses on behavioural science and ethics and series of integrated teaching modules for undergraduate medical education.

Though consortium has been able to achieve a considerable degree of success in restructuring medical education curriculum, it is duly acknowledged that the tasks ahead are far more challenging and vital for producing a definite impact.

The delineation of appropriate **teaching learning methodology** is an important factor for the smooth implementation of the curriculum document. It is, therefore, necessary to work out the details of the same.

It has been recognised that the most important component in curriculum is the **assessment strategy** which overrides other components. It is, therefore, inevitable to work out a comprehensive assessment strategy for measuring the learning outcome.

It will be pertinent to monitor and evaluate the effectiveness of the innovations which are being implemented by various consortium institutes. Appropriate indicators need to be developed for evaluating the process as well as the impact. It is also necessary to promote **health systems research (HSR)** on a continued basis.

Most of the medical colleges in India are ill-equipped to produce **learning resource materials** on their own. It is, therefore, necessary to think of a central

co-ordinated mechanism to produce these materials with collective effort, try-out, finalise and disseminate to all other institutes.

Effective dissemination of the information pertaining to the data base, teaching learning methodology , assessment and other innovations, is considered not only desirable but also essential. For this purpose it is proposed to start a journal, **'Trends in Medical Education'.**

It is envisaged to **expand the consortium** while continuing the inquiry process in eight colleges. This is proposed to be achieved by a mechanism in which each institute works with one or two medical colleges in the region, initiates inquiry process and shares experience with the same. This can be achieved through joint forums-workshops or, exchange visits depending upon the local situation. The institutions involved are listed in the figure.

For the successful implementation of these programmes, the essential instruments have to be developed. In order to utilise the available human resources and their expertise, the tasks ahead are being assigned to each of the consortium institutions. These are:

1. Teaching Learning Methodology	IMS-BHU, Varanasi
2. Assessment Strategy	JIPMER, Pondicherry
3. Health Systems Research	CMC, Vellore
4. Learning Resource Materials	AIIMS
5. Dissemination of information	St.John's Med. College, Bangalore
6. Expansion of the consortium	All Institutions by twinning

The specific details in respect of each of the task forces are given below:

1. TEACHING LEARNING METHODOLOGY

Specific Objectives :

- To produce a resource book (hand book) for indicating:

  a) general guidelines for teaching-learning (b) specific suggestions for certain topics of national thrust.

- To sensitize a group of medical teachers in applying innovative teaching methods and play leadership role at a regional/local level
- To try-out integrated teaching modules on specific needbased topics and to consolidate their findings.
- To set up a regional resource centre for teaching learning methodology.

Methods and Approaches :

The task force will consist of 6-8 medical educators drawn from pre, para and clinical disciplines. It will hold preliminary meeting to plan for two workshops (national) of 3 days duration each targetted at preparing teaching learning methodology for topics of Thrust. About 30 participants belonging to preclinical (10), paraclinical (10), and clinical (10) drawn from local (10) and outside (20) medical colleges will be invited for this workshop. The workshop deliberations will be synthesized into a resource book.

At the end of the first year the task force will hold two onsite workshops in two medical colleges of U.P. These workshops would enable the taskforce to sensitize a new group of teachers who will be able to try out these methods in their colleges and send feed back to the taskforce. The taskforce will consolidate the resource book and present it to the consortium.

A learning resource centre will be established for housing the learning materials and for dissemination which will be equipped with computer, photocopier, fax machine etc.

Proposals for Evaluation and Follow up :

The workshops will have in-built evaluation in the form of session evaluation and course evaluation questionnaires. The efficacy of the resource book will also be evaluated by circulating a questionnaire to selected medical colleges and obtaining their feedback.

2. ASSESSMENT STRATEGY

Specific Objectives :

- To critically review the existing methods used for evaluation in undergraduate medical education for their strengths and weaknesses.
- To develop/refine tools/instruments capable of measuring learning outcomes of three domains (cognitive, affective including communication and psychomotor skills).
- To suggest alternate or additional methods, if any, which are applicable to formative and summative types.

Methods and Approaches :

The Taskforce will consist of 6-8 medical educators based at JIPMER, Pondicherry. It will deliberate separately on each of the following issues:

i) The task force will appraise the current situation by administering a questionnaire to medical college faculty and students.

ii) The task force will hold planning meeting, each of three days duration, to prepare for the workshops for designing instruments.

iii) There will be one or two workshops of three days duration. Each workshop will have 10 outstation participants and 10 local participants from diverse disciplines with proven experience in medical education technology. Each workshop will deliberate on specific issues mentioned earlier and prepare tools/instruments.

Proposals for Evaluation and Follow up:

i) Pre-and post test and programme evaluation of workshops

ii) The instruments developed would be tried first at

JIPMER. Opinion of teachers and students would be obtained.

iii) Later, they will be tried-out in other consortium institutions.

iv) A report will be prepared and submitted.

3. HEALTH SYSTEMS RESEARCH

Specific Objectives :

- To create an awareness and sensitize faculty and students regarding HSR.
- To enable consortium institutes to carry out HSR using a common protocol.
- To identify and overcome impediments in popularising HSR.
- To use HSR as a basic determinant for curriculum planning and community oriented education.

Methods and Approaches :

An initial workshop will be conducted with three members from each institution to discuss methods of health system research and to identify the topic for research to be carried out. A common protocol will be prepared. The role of the faculty and students and the method of assessment of the students will be discussed.

Each member institution will identify a rural or urban community. The protocol will be field tested. A review meeting will be held 4 to 6 months later to analyse the results of the pilot study and to improve the protocol. Using the modified protocol, data will be collected from the community for one year. Institutions where the pilot study is unsatisfactory will not be included in the second phase. Quarterly reports will be sent to the coordinating institutions to be disseminated to the member institutions, State and Central Governments in the form of a news letter. Feed back will be sent to each institution at the end of one year. The project will be for three years.

The studies will provide information related to health conditions and will also document involvement of students and the faculty. Teaching methods, duration of the

programme, period of the MBBS course when students are involved and the students assessment in the community will be documented. The finding will be used to prepare a teaching module on community based education which will be disseminated through the journal of the consortium.

Proposals for Evaluation and Follow up :

The effectiveness of the workshop will be determined by administering questionnaire to the participants in the form of daily evaluation, session evaluation and programme evaluation. The quality of the HSR carried out by each institution will also help to assess the effectiveness of the workshop.

4. LEARNING RESOURCE MATERIALS

Specific Objectives:

- To organize planning, production and dissemination of learning resource materials on need based topics.
- To strengthen/utilize the existing infra-structure for producing learning materials.

Methods and Approaches to be Used :

The taskforce on learning resource materials will consist of three core faculty and five satellite faculty coopted according to the content of the LRM to be produced.

The Strategy Involves :

(i) Identification of areas/topics for the production of LRMs.

(ii) Planning meeting of the taskforce for organizing two workshops (four meetings).

(iii) One workshop for producing prototype LRMs (four) consisting of 10 local and 20 outside participants drawn from diverse disciplines.

(iv)Try-out of the materials in select colleges and obtain feedback (to be done subsequently)

(v) Finalization of the materials; reproduction and distribution through meetings (to be done subsequently)

The K.L. Wig CMET at AIIMS has the infrastructure for the production of learning materials in print and other media such as tape slides, video etc. The actual cost of

production is proposed to be reimbursed from the project funds. The services of production personnel and technical staff will be hired.

Proposals for Evaluation and Follow up :

The effectiveness of the meetings and workshops will be judged by means of session evaluation and program evaluation questionnaire. Indicators will be developed for evaluating the effectiveness of the learning resource materials.

5. DISSEMINATION OF INFORMATION

Specific Objectives :

- To establish proper information and dissemination system for consortium activities.
- To share consortium experiences with larger audiences both nationally and internationally.
- To put on record the updated national developments in the field for posterity.
- To make available international information in an abridged and meaningful form.

Methods and Approaches :

i) St. John's Medical College will identify a group of eight faculty members belonging to diverse disciplines to constitute the task force for dissemination.

ii) The task force will plan and initiate publication of a journal entitled "Trends in Medical Education" twice a year.

iii) The editorial board will be continuously in touch with the consortium institutes to receive information or reports on their activities which will be synthesized and published in the journal.

iv) A computerized system of publication will be developed to enable each of the consortium institutes to quickly access information.

The editorial board will hold three meetings for bringing out one issue - viz, for planning, selecting suitable articles

or refer back for modification, and considering the modified article.

In addition the editorial board members will work individually to perform editorial function.

Proposals for Evaluation and Follow up :

The draft of the journal will be thoroughly screened by the editorial board by developing suitable indicators for the purpose. It is also proposed to circulate questionnaire to the readers to judge the usefulness of the journal and their suggestions will be incorporated for improving the quality of the journal.

6. EXPANSION OF THE CONSORTIUM

Specific Objectives:

- To initiate inquiry driven strategy in two institutes;
- To enable the associate institute to collect database, identify curricular deficiency and adopt suitable innovation.
- To promote leadership in medical education by facilitating a multidisciplinary approach to curriculum development.

Methods and Approaches to be Used :

(i) A group of eight faculty from each of the eight institutes will site visit the new institute(s) for initiating them into consortium.

(ii) To hold an on-site workshop at the associate institute to sensitize them in inquiry driven strategy.

(iii)The newly associated members would conduct inquiry, collect data on mortality/morbility etc. alongwith information on existing curriculum.

(iv)Some of the innovations identified by the consortium will also be tried out in the new institute.

(v) There will be constant interaction between existing and new member to share information on their experiences.

Proposals for Evaluation and Follow up :

The consortium institutions will develop suitable indicators to judge the diffusion of inquiry driven approach into the newly associated institutes. The workshop will have inbuilt evaluation through session and program evaluation questionnaires.