



राष्ट्रीय आयुर्विज्ञान आयोग National Medical Commission

NMC Compendium (2020–2023) – Curriculum –



Volume 1

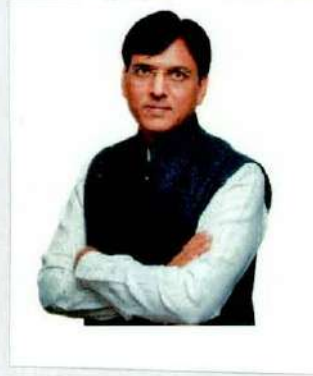
Publication Division, National Medical Commission
Pocket- 14 , Sector – 8, Dwarka Phase -1, New Delhi – 110077, INDIA



डॉ. मनसुख मांडविया
DR. MANSUKH MANDAVIYA



सत्यमेव जयते



MESSAGE

I express my appreciation for the unwavering commitment of the National Medical Commission (NMC), India's Apex Regulatory Authority, in upholding the highest standards in Medical Education. It ensures the delivery of top-notch Medical Education, Practice and Training throughout the nation.

I do appreciate the diligent efforts of NMC in the bringing out of valuable Publications, like the Compendium on NMC Advisories, Public Notices, Circulars & Guidelines for the years 2020-21 and 2022-23 and the Compendium on NMC Regulations (2020-23). I hope that these publications will be a valuable resource for the diverse stakeholders of the health ecosystem including Policymakers, Medical Education Fraternity, Researchers, Clinicians, other Healthcare Professionals, and the general public seeking awareness of Policies and Regulations of Medical Education and Practice.

I extend my heartfelt congratulations to the entire team for publication of the above compendium and hope to have more such commendable endeavors by the Commission in the future.

(Dr. Mansukh Mandaviya)

सुधांश पंत

सचिव

Sudhansh Pant
Secretary



सत्यमेव जयते



MESSAGE

The National Medical Commission (NMC), India's premier regulatory body has been committed to upholding the highest standards in healthcare education, ensuring delivery of quality medical education, practice and training across the nation.

I applaud the diligent efforts of the Publication Team of NMC who have worked hard to bring Publications on Compendium on NMC Advisories, Public Notice, Circular & Guidelines (2020-21), Compendium on NMC Advisories, Public Notice, Circular & Guidelines (2022-23) and Compendium on NMC Regulations (2020-23). I envision that it would serve a variety of audiences such as the policymakers, researchers, clinicians, other health professionals and the public which needs to be aware of the Gazette notification, Advisories, Circulars, Public Notices etc. issued by NMC from time to time.

Congratulations to the team and waiting for more such endeavours.

Sudhansh Pant

(Sudhansh Pant)

Dated 13th November, 2023



डॉ. बी. न. गंगाधर
Dr. B. N. Gangadhar
अध्यक्ष/ President
चिकित्सा मूल्यांकन और मापन बोर्ड
Medical Assessment & Rating Board
& Officiating Chairman, NMC

राष्ट्रीय आयुर्विज्ञान आयोग
स्वास्थ्य एवं परिवार कल्याण मंत्रालय
भारत सरकार
National Medical Commission
Ministry of Health & Family Welfare
Government of India

MESSAGE



I am delighted to announce the publication of the Compendium of the National Medical Commission (NMC). This provides a comprehensive collection of Regulations, Guidelines, circulars, notices, advisories and other important documents.

The compendium is an important milestone in the journey towards mission of NMC; excellence in healthcare delivery. The contents of the compendium help all the stakeholders including the functionaries at NMC to adhere to the standards that will help sound medical education and practice of the profession. The National Medical Commission is committed to fostering an environment of innovation, professionalism and mutual trust within the medical community.

I urge all stakeholders to become familiar with all the Regulations, Guidelines and other advisories brought out by the NMC using this compendium.

Let us all work together to elevate the standards of medical education and care in our country, ultimately benefitting the health and well-being of our fellow citizens.


(Dr B.N. Gangadhar)



डॉ. विजय ओझा
Dr. Vijay Oza
अध्यक्ष/President
स्नातकोत्तर आयुर्विज्ञान शिक्षा बोर्ड
Post Graduate Medical Education Board



सत्यमेव जयते
75
आज़ादी का
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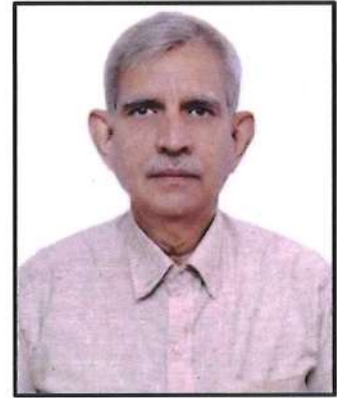


राष्ट्रीय आयुर्विज्ञान आयोग
भारत सरकार
National Medical Commission
Government of India

Message

It gives me immense pleasure in being a part of NMC to share the information with the readers and particularly stake holders about various Public Notifications, circulars, guidelines & regulations issued by National Medical Commission (NMC) and its four Boards.

As the readers are aware, NMC was created by the Act of Parliament on 25th September, 2020 replacing the erstwhile Medical Council of India (MCI). Since all officers and employee of erstwhile Medical council of India were asked to vacate their offices with immediate effect and new staff were appointed over a period of time, there were some difficulties initially. In spite of that everyone in NMC worked hard to stabilize the organization to serve the purpose for which it was created.



I congratulate Prof. Yogender Malik and his team to take up this Herculean task and coming out with this compendium which will be very useful to the students, to the faculty, to the academia at large, to the friends involved in legal system and will also be a window to the world for understanding and following Indian Medical Education, particularly when WFME has accredited NMC for the coming ten years. In turn this will help NMC also by receiving feedbacks and suggestions from various stake holders and luminaries.

Vijay V. Oza.
(Dr. Vijay Oza)

**President,
Post Graduate Medical Education Board, NMC**



भारत 2023 INDIA

डॉ. अरुणा वि. वणीकर

Dr. Aruna V. Vanikar

अध्यक्ष/President

स्नातक चिकित्सा शिक्षा बोर्ड

Under Graduate Medical Education Board



सत्यमेव जयते



MESSAGE

It gives me immense pleasure in being a part of NMC to share the information with the readers and particularly stake holders about various Public Notifications, circulars, guidelines & regulations issued by National Medical Commission (NMC) including Undergraduate Medical Examination Board (UGMEB), from time to time.

As the readers are aware, NMC was created by the Act of Parliament on 25th September, 2020 bringing an end to the erstwhile Medical Council of India (MCI) and the aura associated with it.

This timeline of NMC & UGMEB may be divided into two parts; the first part from year 2020 to year 2021 as covid period; and years 2022 to 2024 as post-covid period. NMC was born in the period when the entire world was caught in snares of the dreadful covid-19 virus pandemic. Medical education of our country was also hit by this attack. By the time, we were recovering from it, Ukraine-Russia war overtook the world scenario and once again affected education of Indian students studying in CIS countries and in neighbouring countries.

Even in this turmoil, NMC continued to function as effectively as possible, with whatever manpower and resources available to it and practically no institutional memory. This publication including a series of Notifications were issued from UGMEB, which includes issues broadly classified as follows. New notifications shall be added as and when needed.

- (i) Related to conduct of medical education and examinations in online and offline mode.
- (ii) Academic calendar for various batches from academic year 2020 to 2023.
- (iii) Regulations/ Guidelines:-
 - Compulsory Rotating Medical Internship Regulations, 2021
 - Foreign Medical Graduate Licentiate Regulations, 2021
 - Prevention of Ragging Regulations, 2021
 - Graduate Medical Education Regulations, 2023
 - Maintenance of Standards of Medical Education Regulations, 2023
 - NMC (MSR) for Establishment of New Medical College/ increase of seats in MBBS course, Guidelines, 2023
 - Establishment of Medical institutions, Assessment & Rating Regulations, 2023".
 - Guidelines for Under Graduate Courses under Establishment of New Medical Institutions, Starting of New Medical Courses, Increase of Seats for Existing Courses & Assessment and Rating Regulations, 2023".

I congratulate Prof. Yogender Malik and his team to take up this Herculean task and bring forth a 'Users' guide' which will be very useful to the students, to the faculty, to the academia at large, to the friends involved in legal system and will also be a window to the world for understanding and following Indian Medical Education, particularly when WFME has accredited NMC for the coming ten years.

Place: New Delhi
Date: 22nd November, 2023



राष्ट्रीय आयुर्विज्ञान आयोग

भारत सरकार

National Medical Commission
Government of India

Aruna V. Vanikar

(Dr. Aruna V. Vanikar)
President (UGMEB)



डॉ. योगेन्द्र मालिक

Dr. Yogender Malik

सदस्य/Member

आचार और चिकित्सा पंजीकरण बोर्ड

Ethics & Medical Registration Board

राष्ट्रीय आयुर्विज्ञान आयोग

भारत सरकार

National Medical Commission
Government of India

From Editor's Desk

In releasing this Compendium, I am extremely grateful for the help, expertise and inspiration to our Hon'ble Chairman-Dr.B.N .Gangadhar, along with Dr.ArunaV.Vanikar-President, Under-Graduate Medical Education Board; Dr.Vijay Oza, President, Post-Graduate Medical Education Board; and Secretary, NMC.



The need for the compendium was felt not only by Members of NMC but also by officers working in NMC and Boards. Even stakeholders from public wanted authentic information online. So, this compendium as one of the most genuine, informative and up to date book for the Registered Medical Practitioners, medical institutions/ organizations, general public and other stakeholders.

I once again appreciate and thank the Govt. departments/ Ministries, and also to our Publication Division staff in helping us making this a reality.

I hope that the associated Boards and agencies will continue to extend their co-operation and shall also provide us their full co-operation, for the benefit of all in future too.

Yogender Malik
(Dr. Yogender Malik) 06.12.2023

Member EMRB and Head
Publication & Media Division
National Medical Commission

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Volume 01: Curriculum

NMC Compendium 2020-2023 – Volume 1

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4.	Guidelines for competency based postgraduate training program for dm in medical genetics dated 25.02.2021	26-62	Guidelines
5.	Draft Guidelines for Competency based Postgraduate Training Program for dm in geriatric mental health dated 02.06.2021	63-89	Guideline
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15.	Competency Based Medical Education Curriculum (CBME) Guidelines, 2023-National Medical Commission. dated 01.08.2023	386-483	Circular
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NATIONAL MEDICAL COMMISSION

Legal/01/2020

Dated: 30.09.2020

To

Dean/Principal
All Medical Colleges/Institutions

Sub: Validity of online classes.

Attention of National Medical Commission has been drawn to some media reports that online classes for teaching of MBBS curriculum were not approved by erstwhile MCI. In this regard it is clarified that in view of Pandemic COVID-19 the Medical Colleges/Institutions in India are conducting online theory classes for MBBS students. Online classes are valid and were approved for teaching during current Pandemic COVID-19 only. Such online theory classes are required to be supplemented by practical and clinical training as per current curriculum in all MBBS subjects in the Colleges/Institutions and affiliated hospitals as and when colleges reopen.

It is further clarified that the media reports appeared to have relied upon the reply given on 13.08.2020 by erstwhile MCI in response to a RTI query which was in reference to the conduct of MBBS teaching curriculum by foreign medical university through online medium only.

Vatm
30/9/20
Dr. R. K. Vats
Secretary

दूरभाष/Phone : 25367033, 25367035, 25367036
फैक्स /Fax : 0091-11-25367024

Website/Email
पॉकेट -14, सेक्टर-8, द्वारका,
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Pocket- 14, Sector- 8, Dwarka,
Phase – 1, New Delhi-110077

राष्ट्रीय आयुर्विज्ञान आयोग National Medical Commission

No. NMC/Secy/2020/05

Dated: 25.11.2020

To

The ACS/Principal Secretary/Secretary in charge of Medical Education (All States/ UTs)
The Director of Medical Education (All States/UTs)
The Dean/Principal/Director, All Medical Colleges/Institutions (All States/UTs)

Subject: Advisory for reopening the Medical Colleges.

Madam/Sir,

Please find enclosed the letter of the Secretary, Ministry of Health and Family Welfare, Government of India addressed to the Chief Secretaries of all States/UTs dated 25.11.2020 alongwith letter of National Medical Commission dated 12.11.2020 with academic calendar including schedule of examinations for all UG batches. It has come to the notice that some medical colleges/institutions have already started class room teaching and have finalized examination schedules which may continue. It is further advised that all medical colleges/institutions shall ensure strict compliance of guidelines issued by the Ministry of Health and Family Welfare and respective State/UT Government about COVID 19 preventive measures including social distancing, use of mask and sanitization measures of hostels, class room, laboratories, lecture theatres, common spaces etc.

Yours faithfully


(Dr. R. K. Vats)
Secretary

Encl: As above.

Copy:-

1. The Secretary, Ministry of Health and Family Welfare, Government of India.
2. The Vice Chancellors of all Universities of Health Sciences.



राजेश भूषण, आईएएस
सचिव

RAJESH BHUSHAN, IAS
SECRETARY



भारत सरकार
स्वास्थ्य एवं परिवार कल्याण विभाग
स्वास्थ्य एवं परिवार कल्याण मंत्रालय
Government of India
Department of Health and Family Welfare
Ministry of Health and Family Welfare

D.O. No.V-11025/235/2020 -MEP
25th November, 2020

Dear Colleague,

This is regarding the re-opening of Medical Colleges in the States and UTs. In this context, I would like to bring to your notice the advice of the National Medical Commission (NMC) tendered vide their letter dated 12th November, 2020, that has suggested that in the best interest of medical education, and from the point of view of standardisation, it is desirable that the medical colleges open at the same time across the country. A copy of the said letter of NMC is enclosed.

After considering all the relevant factors, the NMC has recommended that the colleges may re-open on or before 1st December, 2020. The NMC has also given a suggestive schedule of training for different classes that is annexed with their letter. Further, the NMC has advised that sufficient number of non-COVID beds may be made available in medical college hospitals to facilitate undergraduate medical training. The Ministry has also obtained concurrence from the Ministry of Home Affairs for re-opening of Medical Colleges in the States and UTs.

Accordingly, the States/UTs may take necessary steps to open the medical colleges on or before 1st December, 2020. Needless to say, all the SOPs/guidelines with respect to social distancing and prevention of spread of epidemic issued by Central/State/UT Governments will be followed scrupulously by all the colleges.

Regards.

Yours sincerely,

(Rajesh Bhushan)

Encl.: as above

Chief Secretary/Administrator of all States/UTs

NATIONAL MEDICAL COMMISSION

No. NMC/Secy/2020/03

Dated 12th Nov.2020

To,

The Secretary
Ministry of Health & Family Welfare
Nirman Bhawan,
New Delhi

Sub: Re-opening of Medical Colleges

Ref: Our e-mail dated 3-11-2020

Sir,

The National Medical Commission considered the representations from students and the Medical Colleges for re-opening of medical colleges for undergraduate MBBS students as the Colleges are closed for UG class room teaching, tutorials / practical classes /laboratory and clinical training due to the COVID 19 pandemic. The Commission noted the following:

1. The current batch of interns (2020) have not completed their required clinical training and unless the same is completed, they would not be eligible for appearing for the PG-NEET exam.
2. The PG-NEET exam for academic year 2021-22 has been delayed, as the eligible candidates (interns) will be completing their training late .Their training is required to be completed at the earliest , so that the PG NEET exam for the Academic year 2021-22 can be held in accordingly.
3. Delay in resuming the training, would have a cascading effect on training of next PG and Super-specialty courses in the coming years.
4. The academic session for the fresh MBBS students' for the AY 2020-21 has already been delayed by 4 months and as the UG counselling has started it is imperative that the new MBBS session should also be initiated at the earliest.
5. Further, it was noted that the students today (would-be doctors tomorrow) should also be familiar with the inherent threats and opportunities in health care system which they would eventually handle themselves . It should not become a missed opportunity for medical students to learn the skills of epidemic management as a public health professional.
6. Delaying re-opening of medical colleges has the potential of a null year for the academic year 2021-22 which could result in non-availability of about 80,000 doctors five years later.

After carefully considering all factors, the Commission recommends the following:

1. Medical colleges across the country must re-open on or before 1st December 2020 for the MBBS students already pursuing their course.
2. The delayed new academic session for 2020-21 should commence from 1st February 2021.
3. The new PG session for the academic year 2020-21 should begin from at least 1st July 2021 and therefore the PG-NEET exam for the AY 2021-22 would need to be scheduled around March-April 2021.
4. The Commission also noted that hospitals attached to teaching hospitals have been converted to complete COVID hospitals in several states. However, with opening of the medical colleges, and to facilitate UG training, all medical college affiliated hospitals would need to have sufficient number of beds for non-COVID patients and hence facilities for both outpatient and inpatient management for non-COVID patients must be re-started, if not already done.

It is requested that the Central Government may issue necessary directions to all State Governments for re-opening of medical colleges and also making available non-COVID beds in the affiliated medical college hospitals to facilitate undergraduate medical training. The Colleges shall abide with the COVID 19 reopening guidelines issued by the Competent authorities in Central/State/UT Govts. The proposed schedule of medical training commencing on or before 1st December 2020 as approved by the National Medical Commission is annexed.

Yours faithfully



(R. K. Vats)

Secretary

NMC

Annexure: Tentative Scheduling of MBBS curriculum from 2021-2024

Batch	2021												2022												2023												2024												2025	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2												
Month	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2												
Intern (2015)																																																		
III (2) (2016)				E																																														
III (1) (2017)				E									E																																					
II (2018)				E									E																																					
I (2019)				E									E												E																									
2020													E																																					
2021																																																		
2022																																																		
2023																																																		

E = Examination

	Intern	III(2)	III(1)	II	I	Start of PG course

National Medical Commission

GUIDELINES FOR RE-OPENING OF MEDICAL COLLEGES POST LOCKDOWN DUE TO COVID-19 PANDEMIC

(29th November 2020)

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Generic Preventive Measures/COVID-19 Appropriate Behaviour

The following health measures are to be followed to reduce the risk of COVID-19 by all (faculty members, employees, students and visitors) at all times:

- I. Physical distancing of at least 6 feet to be followed as far as feasible.
- II. Use of face covers/masks to be made mandatory.
- III. Frequent hand washing with soap (for at least 40-60 seconds) even when hands are not visibly dirty. Use of alcohol-based hand sanitizers (for at least 20 seconds) can be done wherever feasible.
- IV. Respiratory etiquettes to be strictly followed. This involves strict practice of covering one's mouth and nose while coughing/sneezing with a tissue/handkerchief/flexed elbow and disposing of used tissues properly.
- V. Self-monitoring of health by all and reporting any illness at the earliest.
- VI. Spitting shall be strictly prohibited.
- VII. Installation & use of Aarogya Setu App shall be advised wherever feasible.

1. Introduction

Universities and other educational institutions across the country have been closed since last week of March, 2020 when the Government of India announced a countrywide lockdown as one of the measures to contain the COVID-19 outbreak. The Government of India through its Ministries, viz., Ministry of Home Affairs, Ministry of Health, Ministry of AYUSH and Ministry of Education took several initiatives to contain the spread of the virus and issued directives and advisories to educate the people about the gravity of the infection from Coronavirus and the measures to protect from it. Specific instructions were also issued to the universities and colleges by the Ministry of Education and the UGC in this regard.

The University Grants Commission issued "Guidelines on Examinations and Academic Calendar for the Universities in View of COVID-19 Pandemic and Subsequent Lockdown" on 29th April, 2020 and then, on 6th July, 2020. These Guidelines covered important dimensions related to examinations, academic calendar, admissions, online teaching-learning and provided flexibility for adoption by the universities. Later "UGC Guidelines on Academic Calendar for the First Year of Under-Graduate and Post-Graduate Students of the Universities for the Session 2020-21 in View of COVID-19 Pandemic" were issued on 24th September, 2020.

In order to contain the spread of COVID-19 pandemic in the educational institutions and to ensure continuity in teaching- learning process, Ministry of Education and UGC issued several directives/ advisories/ guidelines to the universities and colleges, including the one to impart online education by making the best use of e-resources. Through all the communications made by Ministry of Education and UGC, it was emphasized to continue with teaching-learning processes using online modes such as Google Classroom, Cisco Webex Meeting, YouTube streaming, OERs, SWAYAM platform (www.swayam.gov.in), Swayam Prabha (www.swayamprabha.gov.in) (available on Doordarshan (Free dish) and Dish TV), e-yantra (www.e-yantra.org), Virtual Labs (www.vlab.co.in), FOSSEE (<https://fossee.in>), application of spoken tutorials (www.spoken-tutorial.org), National Digital Library (NDL) (<https://ndl.iitkgp.ac.in>), electronic journals (<https://ess.inflibnet.ac.in>) etc.

The medical colleges/institutions have been advised to re-open on or before 1st December, 2020 and the colleges are advised to use these guidelines as well as the guidelines issued by MoH &FW, and UGC (***SOP on preventive measures to contain spread of COVID-19 in skill or entrepreneurship training institutions, higher educational institutions conducting doctoral courses and post graduate studies in technical & professional programs requiring laboratory /experimental work*** <https://www.mohfw.gov.in/pdf/FinalSOPonSkillinstitutions&PGinstitutes08092020.pdf> and ***Revised SOP on preventive measures to be followed while conducting examinations to contain spread of COVID-19*** <https://www.mohfw.gov.in/pdf/RevisedSOPonpreventivemeasurestobefollowedwhileconductingexaminationstocontainspreadofCOVID19.pdf>). The colleges are advised to make their own

schedule tailor-made as per the local prevailing social and medical conditions so as to effectively deal with any eventuality arising due to COVID -19/ post-COVID-19 conditions before resuming activities on campuses. The reopening of colleges will relieve the teaching and academic staff, as well as students from uncertainties regarding students' career, mode of functioning including the conduct of physical classes.

It is felt that even after the spread of Corona virus is contained, certain preventive measures will be required to be followed for quite some time to avoid its recurrence, especially in educational institutions like medical colleges.

2. Re-Opening the Campuses - Issues and Challenges

Our colleges are located in all kinds of terrains and assume significant diversities depending upon geographical location and government run/ grant-in- aid colleges or colleges managed and supported by private organizations, in their size, infrastructural capacity, facilities, etc. Therefore, the issues and challenges faced by them in reopening their campus also vary considerably.

Keeping in view the uncertainties of future due to COVID-19 pandemic and its impact on the functioning, they may plan to reopen their campuses in a phased manner, ensuring safety, health and well-being of all students and staff. They should be flexible in their plan and should be ready to handle any eventuality arising due to COVID-19.

It may be difficult to comprehend all the challenges/ situations which the colleges may be required to handle while they plan to reopen. However, some of the issues which they may be required to handle instantly are given below:

- I. To follow the advisories/guidelines/directions issued by the Central/State Government, Ministry of Education, NMC and UGC from time to time to prevent the spread of COVID-19.
- II. Uncertainty among students regarding admissions, modes of teaching-learning, completion of courses, examinations, evaluation, declaration of results and the academic calendar, etc.
- III. Anxiety, mental health and psychological issues of students developed during the lockdown period and fear of infection after the opening of campuses.
- IV. Safety measures including sanitisation of premises, thermal screening, ensuring physical distancing, face-cover/mask wearing, respiratory hygiene and hand-hygiene etc.
- V. Preparation for risk assessment and subsequent actions which may be required for hostel facilities for students.
- VI. Varied conditions of the pandemic in the state, area and environment where the students mainly live while making risk assessment and planning to address these challenges.
- VII. Besides students, the risk of infection will also be faced by the faculty, counsellors and other technical and non-teaching staff who interact with the students and also among themselves regularly.

3. Measures Required before Re-Opening of Campuses

The MoH & FW and National Medical Commission, have advised all medical colleges to re-open on or before 1st December, 2020 to maintain uniformity in academic environment of the nation. However since the states/UTs are in different COVID-19 phases, colleges are likely to face a number of issues at the time of reopening. Hence they will be required to plan in advance and will have to take certain measures prior to reopening, as mentioned below:

3.1 Pre-requisites

- i. The directions, instructions, guidelines and orders issued by the Central and State /UT Government concerned regarding safety and health in view of COVID-19 must be fully complied by all colleges.
- ii. However, the colleges may develop stricter provisions and guidelines, if they feel it necessary. The colleges are required to make adequate arrangements to ensure the safety and health of students, faculty and staff.
- iii. The universities and colleges are advised to re-open in phase-wise manner.
- iv. The faculty, staff and students of the university and college should all download 'Aarogya Setu App'.
- v. The institutions should be ready with a plan for handling the inflow of students, faculty and staff in the campus, monitoring disinfecting measures, safety and health conditions, screening and detecting the infected persons, containment measures to prevent the spread of the virus in the campus, and also alternative plan(s), in case the campus needs to be closed again due to spread of the virus in campus or in the surrounding area(s) in near future.

3.2 Modalities for Physical Opening of Colleges

The following modalities regarding the physical opening of Colleges/Higher Education Institutions, in a graded manner, may be adopted:

- i. Colleges may plan opening the campuses in phases, with such activities where they can easily adhere to social distancing, use of face masks and other protective measures. This may include administrative offices, research laboratories and libraries etc.
- ii. Thereafter, for didactic lectures, students may also be taught on-line by using Google Classroom, Cisco Webex Meeting, You Tube streaming, OERs, SWAYAM platform

(www.swayam.gov.in), etc. In those colleges, where it is feasible to hold classes, for large group or small group teaching classes, a minimum distance of 6 feet between every 2 students must strictly be adhered to. If required students may be called in batches as per the availability of class room size and all other modalities.

- iii. For all teaching hospitals, at least 30% beds be allotted to teaching units and all necessary precautions must be adhered to.
- iv. As and when required, students may be instructed to visit their respective departments in small groups for consultation with the faculty members, after seeking prior appointments to avoid crowding, while maintaining physical distancing norms and other safety protocols.
- v. Institutions should have a plan ready for students who cannot join the programme due to travel restrictions. Online teaching-learning arrangements should also be made for them.

3.3 Safety concerns

1. The institutions should train their staff and students to assist and undertake the work related to safety and health to prevent an outbreak of the pandemic in their campuses. Non-resident students should be allowed in campuses only after thermal scanning, sanitization of their hands, wearing of face masks and gloves. Symptomatic persons should not be permitted to enter the campus and should be advised to contact the nearest hospital for clinical assessment.
2. Regular visits of a counsellor may be arranged so that students can talk with the counsellor about their anxiety, stress or fear.
3. To avoid the risk of transmission, the students, faculty and staff should be screened and symptomatic ones be advised to get clinically assessed before allowing them entry into the campus.
4. Isolation facilities for symptomatic persons and quarantine facilities for those who were in contact with the positively tested persons should be there on campus or a tie-up may be made in advance with some hospital or approved premises or as advised by the local authorities so that, in case of necessity, prompt action may be taken. Proper arrangement of safety, health, food, water etc. should be ensured for those in quarantine and isolation facilities.
5. For those who have tested positive, isolation facilities should be in place either on campus itself or as a prior arrangement with some nearby hospital(s) or as advised by the local authorities.
6. Colleges should prepare a policy for restricting the outside experts on campuses, study tours, field works etc., keeping in mind the COVID-19 situation.

7. All such programmes and extracurricular activities should be avoided where physical distancing is not possible.
8. Clean and hygienic conditions, as per safety and health advisories of the concerned government departments, are to be maintained at all places, including hostel kitchens, mess, washrooms, libraries, class rooms etc.
9. Proper signages, symbols, posters etc. should be prominently displayed at appropriate places to remind the students, faculty and staff for maintaining physical distancing. The details of COVID-19 cell established by the institution be prominently displayed containing the emergency number, helpline number, email id and contact details of persons to be contacted in case of any emergency in the institution. Ensure the norms of physical distancing, sanitization and hygienic conditions for use of common facilities, viz., Auditorium, Conference/ Seminar halls, Sports, Gymnasium, Canteen, Parking Area etc.
10. Ensure the norms of physical distancing, sanitization and hygienic conditions for use of common facilities, viz., Auditorium, Conference/ Seminar halls, Sports, Gymnasium, Canteen, Parking Area etc.

4. Institutional Planning

Institutional planning is the key for the successful reopening of the campuses and smooth conduct of the teaching-learning process during these difficult times. The colleges will therefore, be required to develop their plans very cautiously for reopening of their campuses. The plan may, inter-alia include the following points:

- i. Colleges should prepare details of opening the campus in a phased manner with a complete roster for all departments and batches of students in different programmes.
- ii. The colleges must ensure appropriate sanitization and disinfection process and procedures.
- iii. It should be made mandatory for the Teachers, Officers, Staff and Students to wear the ID cards.
- iv. The faculty, student, staff should be screened regularly to protect and avoid infecting one another.
- v. All preventive measures, preparedness and necessary support system to deal with the COVID -19 positive cases should be monitored and reported to local authorities on a day to day basis.
- vi. Teaching hours in a day may be extended, as per requirements of the college.
- vii. Six-day schedule may be followed so that classes can be conducted in phases and the seating arrangement be made keeping in view the requirements of physical distancing.
- viii. Colleges may consider reducing the class size and break them in multiple sections to maintain physical distancing during the classes.
- ix. Depending on the availability of space in class rooms or learning sites, up to 50% students may be allowed on a rotation basis to attend the classes.
- x. Faculty should be trained for online teaching-learning practices.
- xi. The visitors should either not be allowed at all or their entry should be drastically restricted. The conditions of the entry for visitors should be strictly laid down and displayed on the entry point(s). Complete contact details of the visitors be maintained along with the names of persons whom he/ she meets.
- xii. There should be adequate isolation arrangements for those having symptoms and also for those who test positive for COVID-19 (however the two need to be kept separately), either at the level of the institution or in collaboration with the Government authorities.

4.1 Safety Measures at Entry/ Exit Point(s)

- i. Adequate arrangements of thermal scanners, sanitizers, face masks should be made available at all entry and exit points, including the reception area.
- ii. Crowding must be avoided at entry/ exit points. Staggered timings of entry and exit with limited strength for different programmes should be followed.
- iii. For ensuring queue management, inside and outside the premises, specific markings on the floor with a gap of 6 feet may be made and be adhered to.
- iv. In case the college has more than one gate for entry/ exit, all the gates should be used, with adequate care, to avoid crowding.
- v. Monitoring of the entry and exit of the students should be done.
- vi. Screening of students, faculty and staff, wearing of face covers/ mask, sanitizing of hands etc. must be ensured at all entry points.
- vii. Those having symptoms of fever, cough or difficulty in breathing should not be allowed to enter.

4.2 Safety Measures during Working Hours

4.2.1 Classrooms and other Learning Sites

- i. Proper sanitization at all learning sites should be ensured. Cleaning and regular disinfection (using 1% sodium hypochlorite) of frequently touched surfaces (door knobs, elevator buttons, hand rails, chairs, benches, washroom fixtures, etc.) to be made mandatory in all class rooms, laboratories, (and also) lockers, parking areas, other common areas etc. before the beginning of classes and at the end of the day. Teaching materials, computers, laptops, printers, shall be regularly disinfected with 70% alcohol swipe.
- ii. Sitting places in classes, laboratories, computer labs, libraries etc. should be clearly marked, keeping in view the norms of physical distancing. At least one seat should be left vacant between two seats.
- iii. Wearing face cover/ mask is a must at all times and at all places inside the campus.

4.2.2 Inside the Campus

- i. Cultural activities, meeting etc. may be avoided. However, such extra-curricular and sports activities may be allowed where physical distancing is feasible and is in accordance with the Ministry of Home Affairs guidelines, issued under Disaster Management Act, 2005 from time to time.
- ii. Adequate arrangements for safe drinking water should be made on the campus.
- iii. Hand washing stations with facilities of liquid soap should be created so that every student can wash her/ his hands frequently.
- iv. Regular and sufficient supply of face covers/ masks, heavy duty gloves, disinfecting material, sanitizer, soaps etc. to sanitation workers should be ensured.
- v. Wearing of face cover/ mask by all students and staff should be ensured.
- vi. Proper cleanliness should be maintained inside the entire campus.
- vii. Adequate arrangements should be made for sanitizing the entire campus, including administrative and academic buildings, classrooms, laboratories, libraries, common rooms, toilets, water stations, furniture, learning material, teaching aids, sports equipment, computers etc.
- viii. Physical distancing should be maintained at all places and crowding must not be allowed at any place under any circumstances.
- ix. An adequate supply of water in toilets and for hand- washing should be ensured.
- x. Proper sanitization of buses, other transport and official vehicles of the institution should be done.
- xi. Spitting in the campus must be made a punishable offence.
- xii. Dustbins must be cleaned and covered properly.
- xiii. Dustbin for collection of used facemasks, personal protective equipment, hand gloves and their disposals should be ensured as per safety norms. Provision for proper disposal of used personal protection items and general waste should be followed in accordance with CPCB

guidelines (available at: https://cpcb.nic.in/uploads/Projects/Bio-Medical-Waste/BMW-GUIDELINES-COVID_1.pdf).

- xiv. For air-conditioning/ventilation, the guidelines of CPWD shall be followed which emphasizes that the temperature setting of all air conditioning devices should be in the range of 24-30oC, relative humidity should be in the range of 40-70%, intake of fresh air should be as much as possible and cross ventilation should be there.
- xv. Gymnasiums shall follow MoHFW guidelines (available at: <https://www.mohfw.gov.in/pdf/Guidelinesonyogainstitutesandgymnasiums03082020.pdf>).
- xvi. Swimming Pool (wherever applicable) shall remain closed.
- xvii. All employees who are at higher risk, i.e., older employees, pregnant employees and employees who have underlying medical conditions to take extra precautions. They should preferably not be exposed to any front-line work requiring direct contact with the students.

4.2.3 Hostels

- i. Hostels may be opened only in such cases where it is necessary while strictly observing the safety and health preventive measures.
- ii. All Students must bring all a RT-PCR report that is negative at the time of re-joining the hostels and they must be re-called in batches.
- iii. However, the sharing of rooms may not be allowed in hostels. Symptomatic students should not be permitted to stay in the hostels under any circumstances.
- iv. Since residential students may be coming from different locations, they shall remain in quarantine and self-monitor their health for a period of 14 days before being allowed to attend classes or as per the policy opted by the State Government for quarantine (even if they bring a negative test report or the university/college plan to test them on arrival).
- v. There should be no crowding in hostel areas where students live in close proximity and share common facilities and utilities. Hence, their numbers need to be limited appropriately to avoid crowding. Also, hostel students should be called in phases.
- vi. Thermal Screening of all resident students should be ensured.
- vii. They will be referred to the nearest COVID treatment facility for clinical assessment and treatment.

- viii. Density in dining halls, common rooms, playing areas should be limited, keeping in view the requirement of physical distancing.
- ix. Hygiene conditions should be regularly monitored in kitchens, dining halls, bathrooms and toilets etc.
- x. Cleanliness is to be maintained in dining areas. Meals should be served in small batches, avoiding over-crowding. Take away options should be available for students and staff.
- xi. It must be ensured that the meals are freshly cooked. A senior staff should monitor the same.
- xii. Utensils should be properly cleaned.
- xiii. Wearing of face covers/ masks and proper sanitization of hands of the staff engaged for the preparation and distribution of meals should be ensured.
- xiv. Resident students and staff should avoid or limit visiting the markets. As far as possible, essential items may be made available within the campus.
- xv. Hostels may define the number of students in dining halls at any point in time. Mess timings may be increased to avoid overcrowding.

4.2.4 Regular Monitoring of Health

- i. Every institution should regularly monitor the health of its students, faculty, and staff.
- ii. Faculty, staff and students should also be sensitized on self-monitoring of their health.
- iii. Faculty, Staff and students should submit self-disclosure, if any of their family members have been infected/availed treatment for COVID-19.

4.2.5 Counselling & Guidance for Mental Health

In order to reassure the students' community to avoid any kind of stress or panic in the prevailing situation *vis-a-vis* their studies, health and related issues, colleges should take the following measures for the mental health, psychological aspects and well-being of the students:

- i. All the faculty members, students and staff should be made aware of the Web page named "Manodarpan" – created on the Ministry of Education website to provide psychosocial support for Mental Health & Well-being during the COVID – 19 outbreak and beyond. The web page contains advisory, practical tips, posters, videos, dos' and don'ts for Psychosocial

support, FAQ and online query system. Also, a National Toll Free Helpline (8445440632) for country wide outreach to students from schools, colleges and universities has also been set up which will provide tele counselling to address their mental health and psychosocial issues.

- ii. Set up helplines for mental health, psychological concerns and well-being of students in Universities/ Colleges which need to be regularly monitored by Counsellors and other identified faculty.
- iii. Regular mentoring of students through interactions, and appeals/letters by the Universities/ Colleges to remain calm and stress-free. This can be achieved through telephones, e-mails, digital and social media platforms.
- iv. Form COVID-19 help groups of students headed by hostel wardens / senior faculty who can identify friends/ classmates in need of help and provide the immediate necessary help.
- v. Share the following video links of Ministry of Health & Family Welfare <https://www.mohfw.gov.in> on the University/ College website and with students and faculty via e-mail, through social media like Facebook, WhatsApp and twitter etc.
 - Practical tips to take care of your Mental Health during the Stay In <https://www.youtube.com/watch?v=uHB3WJsLJ8s&feature=youtu.be>
 - Minding our minds during the COVID-19 <https://www.mohfw.gov.in/pdf/MindingourmindsduringCoronaeditedat.pdf>
 - Various Health Experts on how to manage Mental health & Well Being during COVID-19 outbreak <https://www.youtube.com/watch?v=iuKhtSehp24&feature=youtu.be>
 - Behavioral Health: Psycho-Social toll free helpline - 0804611007

4.2.6 Measures for Containment

- i. As soon as a student, faculty or staff is detected COVID-19 positive, such person should be immediately isolated as per the directive/advisory of the Government. Room-mates and close contacts should be quarantined and symptomatic ones to be immediately tested.
- ii. Universities and colleges should have a ready plan to provide healthcare support to those resident students and staff who test positive and are isolated.
- iii. The guidelines restricting social and physical contacts and mobility in such parts of residential places in the campus, where positive cases have been found, should be strictly enforced. Measures like holding no class, not leaving the rooms for hostellers, if applicable,

no take away arrangement of food from mess etc. may be enforced, depending upon the severity of the situation.

- iv. Universities and colleges should also plan in advance, in case shut down are ordered by the Government due to outbreak in campus or the surrounding region.

4.2.7 Sensitization of Students, Teachers and Staff

- i. Awareness programmes regarding COVID-19 as to how the infection spreads, common symptoms, and precautions and measures required to contain its spread may be launched.
- ii. Maintaining hygiene, e.g., how to wash hands, how to cough or sneeze into a tissue or elbow, avoid touching of face, eyes, mouth and nose should be regularly told to the students and the staff.
- iii. The necessity of physical distancing, wearing face covers/ masks, hygiene etc. should be brought home to all.
- iv. Activities to stay fit, physically and mentally, should be encouraged like doing exercises, yoga, breathing exercises, meditation, etc.
- v. To improve resilience and mental health, students should be encouraged to share their feelings with friends, teachers and parents, remain positive, grateful, helpful, have focussed approach, take a break from work, eat healthy and sleep timely etc.
- vi. Eating healthy food and fruits, avoiding junk food, frequently drinking warm water, adopting ways to increase immunity etc. should be encouraged.
- vii. Students should be told to regularly sanitize their laptops, audio, video and other media accessories.
- viii. Factual information regarding COVID-19 and consequences of infection, without making them stressed or fearful, should be disseminated.
- ix. Posters and stickers should be pasted at appropriate places in the campus to create awareness about the risk of infection from Coronavirus.
- x. All support and facilities should be provided to persons with disabilities (*Divyangjan*).
- xi. No discrimination based on caste, creed or gender should be allowed to take place.
- xii. Sharing of books, other learning material and eatables be discouraged.

5. Role of Stakeholders

5.1 Role of State Governments/ UTs

- i. The Government should help colleges to prepare an effective plan for reopening their campuses. The plan may vary from institution to institution, keeping in view the situation regarding spread of COVID-19 pandemic in a particular area/region/zone.
- ii. The Governments may issue clear instructions to the universities and colleges to ensure the safety and health of all concerned. This may include instructions for wearing of face masks, physical distancing, and the number of students in a class, library, hostels, and dining halls etc.
- iii. State governments, in consultations with higher education institutions, should prepare an estimate of requirement in each of their districts and zones, of disinfectants, facemasks and prepare a plan in advance for their procurement and distribution. Universities and colleges should ensure sufficient supplies of these items to their students, faculty and staff.
- iv. Keeping in view the varying conditions in any state at district and zonal levels, the Government concerned should prepare a region-specific plan, instead of a uniform plan for the entire state.
- v. State health departments should remain in touch with the universities and colleges and work to ensure that the campuses are well prepared to maintain the safe and healthy conditions and also to deal with the COVID-19 related unexpected situations.
- vi. The Governments should keep a constant touch with the universities and colleges regarding the status of COVID-19. The government may call information regarding COVID-19 related condition in the campuses and also call meetings at appropriate intervals with the Head of institutions through video conferencing.

5.2 Head of the Institution

- i. Principals may get Standard Operating Procedures(SOPs) worked out in view of COVID-19 outbreak, in accordance with the Government orders and guidelines.
- ii. A detailed institutional plan which may, inter alia, include sanitization, safety and health measures should be prepared and kept ready, before reopening of campus. Proper implementation of the institutional plan should be ensured and regular monitoring should be done with the help of faculty and the staff.
- iii. Tie-ups may be established with nearby hospitals, health centres, NGOs, health experts for help and support in fighting COVID-19.

- iv. iv. A plan for all academic activities, i.e., the academic calendar, teaching-learning modes, examinations, evaluation etc. should be kept ready well in advance.
- v. A Task Group should be created to handle varied situations and issues related to the COVID-19 pandemic. Such Task Group may consist of senior persons from faculty and staff, students, volunteers from communities, NGOs, health organisations and Government officials etc. as the case may be.
- vi. Teachers, students and staff should be made aware of all relevant plans and activities on the campus.

5.3 Teachers

- i. Teachers should make themselves fully aware of institutional plans and Standard Operating Procedures.
- ii. Every teacher should prepare a detailed teaching plan for the subjects taught by him/her, including time table, class size, modes of delivery, assignments, theory, practical, continuous evaluation, end- semester evaluation etc.
- iii. Teachers should keep themselves updated with the latest teaching- learning methods and availability of e-resources.
- iv. Teachers should make the students aware of the COVID-19 related situation, precautions and steps to be taken to stay safe and healthy.
- v. Teachers should monitor and keep track of the physical and mental health of their students.

5.4 Parents / Guardians

- i. The parents/ guardians should ensure that their children observe safety norms at home and whenever they go out.
- ii. Parents should not allow their children to go out, if they are not feeling well.
- iii. Parents may be advised that the 'Aarogya Setu App' has been downloaded by their children.
- iv. Parents should sensitize them of healthy food habits and measures to increase immunity.
- v. Parents should ask them to do exercise, yoga, meditation and breathing exercises to keep them mentally and physically fit.

5.5. Students

- i. Self-discipline is most important to contain the spread of COVID-19 pandemic through social distancing and maintaining hygienic condition.

- ii. All students should wear face covers/ masks and take all preventive measures.
- iii. May consider installing 'Aarogya Setu App' in the mobile.
- iv. It is important for the students to be physically and mentally fit to handle any exigencies. By remaining fit, they can take care of others also.
- v. The students must inculcate activities that will increase immunity-boosting mechanism which may include exercise, yoga, eating fresh fruits and healthy food (avoid fast food), sleep timely.
- vi. Discrimination of fellow students in respect of whom there is a history of COVID-19 disease in the family be avoided.
- vii. Give support to your friends under stress due to COVID-19 pandemic.
- viii. Students should follow the guidelines, advisories and instructions issued by the Government authorities as well as by the universities and colleges regarding health and safety measures in view of COVID-19 pandemic.

6. Present scenario and future uncertainties

- i. The colleges may adopt and implement these Guidelines in a transparent manner by making alterations/ additions/ modifications/ amendments to deal with particular situation(s) in the best interest of students, educational institution and the entire education system, except in respect of those guidelines that are mandatory.
- ii. In case of educational institutions located at places where the Government (Centre/ State) have imposed restrictions on gathering of public, the institutions may plan accordingly. In any case, the above recommendations shall not cause any restrictions on the guidelines/directions issued by the appropriate Government/ competent authority.

Notwithstanding the above Guidelines, every college has to ensure that it is well prepared in all respects to carry out the academic activities following necessary advisories/guidelines/directions issued by the NMC, Central/State/UT Government, Ministry of Education (earlier referred to as MHRD) or UGC from time to time to prevent the spread of COVID-19.

**NATIONAL MEDICAL COMMISSION
ACADEMIC CELL**

D 11011/1/21/AC/Guidelines 03

Date: 25-02-2021

**GUIDELINES FOR COMPETENCY BASED POSTGRADUATE
TRAINING PROGRAMME FOR DM IN MEDICAL GENETICS**

Preamble

There have been significant advances in the field of Medical Genetics in recent years, which are of direct relevance to patient care. Following the completion of the Human Genome Project and the development of advanced molecular genetic testing technologies such as microarray and next generation sequencing, the genetic basis of a large number of chromosomal, monogenic as well as multifactorial disorders has been identified and many novel genetic disorders are being continuously discovered. This will include not only the genes causing monogenic disorders, but also those which predispose to complex multifactorial disorders and those which may be responsible for causing cancer, autoimmunity & aging.

Antenatal diagnosis is currently being offered for chromosomal, monogenic and copy number variations (CNVs) disorders. With wider availability of carrier screening in coming years, primary prevention of genetic disorders will be possible and thus will prevent the birth of a first affected child with genetic disorder. Other important clinical application is pre-symptomatic diagnosis of late onset diseases including cancers.

Advances of genetic technologies have already led to radical changes in the practice of Medical Genetics as well as concepts of genetic counselling. Access to these benefits that aim at birth of healthy children could be of immense importance to our National Family Welfare Program. Besides prevention, better understanding of pathophysiology of genetic diseases shall open new avenues of pharmaco-therapy, and even cure by gene therapy, of these disorders. Availability of treatments using many novel strategies like enzyme replacement therapy, drugs acting on molecular pathways, gene therapy, antisense oligo therapy and drugs for readthrough stop codon mutations has caused paradigm change in the management of many monogenic disorders. This

calls for trained specialized medical professionals to deal with genetic disorders with expertise in diagnosis, treatment and genetic counseling. The proposed course aims to train internists, pediatricians and obstetrician & gynecologists in this super-specialty and provide state of art medical genetics services to the patients and families with genetic disorders.

Eligibility for DM Medical Genetics Course

Post graduate degree in Medicine, Pediatrics or Obstetrics & Gynecology.

SUBJECT SPECIFIC OBJECTIVES

Competency based training for DM in Medical Genetics aims to produce a post graduate student who after undergoing the required training should be able to deal effectively with the needs of the patients, community and should be competent to handle medical problems related to genetic disorders. These include clinical evaluation, investigations, genetic work ups requiring pre-test and post-test counseling, up to-date information and abilities to carry out novel treatments and skills for planning and implementation of population-based prevention programs. Last but not least, be ready for carrying out clinical practice of personalized medicine in the 21st century molecular medicine era. The post graduate student should also acquire skills to teach Medical Genetics to undergraduates and paramedical students as well.

Thus, the objectives of DM in Medical Genetics course are to produce a competent Medical Geneticist who:

1. is a medical doctor who can evaluate a patient with possible genetic disorder, ascertain the risk of a genetic disorders, make a clinical diagnosis, able to decide appropriate test to confirm the diagnosis and provide latest form of treatment. The other goal is genetic counseling to the patient, family and extended family about management, carrier screening, prenatal diagnosis and prevention.
2. is aware of contemporary advances and developments in Medical Genetics, and ways for continued learning for keeping updated about diagnostic investigations, technological developments and treatment.

3. is trained in use of novel clinical ways of phenotyping, use of software for phenotyping and correlation with genotypes, interpretation of genetic variants and CNVs regarding their pathogenicity and causal nature and comfortable with the use of databases of genetic disorders, CNVs and genetic variants.
4. acquires the competencies pertaining to Medical Genetics that are required for practice in the community and at all levels of health system, especially population-based prevention program, screening for late onset disorder and susceptibility to cancer.
5. recognizes the health needs of patients and families with genetic disorders and carries out professional obligations in keeping with principles of the National Health Policy and professional ethics.
6. identify the disorders which are prevalent in Indian populations (identifying pockets).
7. is oriented to principles of research methodology.
8. has acquired skills in educating lay persons, medical and paramedical professionals.
9. has acquired skills in effectively communicating with the person, family and the community.
10. has acquired skills in DNA diagnostic tests including those for screening of carriers and antenatal diagnosis, as well as pre-morbid diagnosis for primary prevention (predictive/preventive medicine), being aware of the PCPNDT 2003 Act and related guidelines as well as processes.
11. has acquired knowledge and skills in genetic counseling and have developed confidence in psychological & social issues involved.

During the course, the student should acquire the following knowledge/skills/expertise:

A. Theoretical Knowledge:

The post graduate student in Medical Genetics must acquire knowledge in all aspects relevant to the practice of medical genetics. This includes clinical presentations of genetic disorders, organ specific genetic disorders, principles of basic genetics, genetic counseling, and knowledge of genes, chromosomes, genome and epigenome including molecular techniques. In whole, this is described as genomic medicine.

B. Clinical/Practical Skills:

The post graduate student must undergo training in all aspects relevant to the practice of Medical Genetics, be able to clinically evaluate, interpret genetic laboratory data and diagnose, investigate and manage patients with gene related conditions. This is similar to any other organ based clinical super-specialty. Here, the disorders for which the expertise is needed are not specific to any organ or system; but are those where genetic etiology is known. The steps and principles are similar to any clinical situation and involves [1] history taking and examination of a patient to draw up a differential diagnosis, [2] advise the relevant non-genetic and genetic investigations, and [3] treatment of the patient. However, genetic disorder has other implications for the patient and the family due to genetic nature of the etiology and medical geneticist has two more responsibilities, namely counseling the family for prevention and recurrence risks and prenatal diagnosis in appropriate conditions.

C. Teaching Skills:

Should be able to teach relevant aspects of genetic diseases to junior colleagues, nursing and para-medical staff. Population based screening programs like antenatal, neonatal screening and screening for susceptibility to late onset disorders are important components of medical genetics and advocacy, communication with lay persons and educating lay persons, society leaders, policy makers are the responsibilities of medical genetics community and require appropriate skills for teaching in informal ways.

D. Research Methodology:

Should be able to identify and investigate a research problem in Medical Genetics using appropriate methodology and molecular techniques. Most of the genetic disorders being rare, many cases even in clinical settings need research approach. This needs in depth understanding of deep phenotyping, genomic techniques, principles of ethics and guidelines for ethics of research. This needs access to and understanding of rules and regulations of Ethics Committee.

E. Group Approach:

There is some overlap of patients seen by medical geneticists with other organ-based specialists. The organ-based specialists may need expert opinion from medical geneticists about genetic disorders and medical geneticists may need clinical opinion and guidance /

support for management from the specialist like neurologist, ophthalmologist, etc. Hence ability to organize /participate in multi-disciplinary meetings with clinicians, laboratory colleagues and experts from allied clinical disciplines is necessary in the interest of the patients. The medical geneticist when counseling or acting as a consultant, must know the impact of genetic heterogeneity, pleiotropy, variable expression and lack of penetrance, so that the validity and accuracy of the diagnosis is assured. Therefore, the medical geneticist requires a broad exposure to genetic disease as it occurs in the area of many specialties/subspecialties so as to be competent to question, validate, or consider a new diagnosis. This knowledge will include the ability to appropriately use consultations with other specialists who may not be aware of these intricacies of genetic approaches.

The most important related specialties in which the student should gain experience include: Internal Medicine, Pediatrics, Obstetrics and Gynecology, Cardiology, Radiology (skeletal) including prenatal ultrasound, Endocrinology, Hematology, Oncology, Nephrology, Neurology, Physical Medicine & Rehabilitation, Psychiatry, Ophthalmology, Clinical Immunology, Clinical Pharmacology, and Orthopedics. Combined case wise interaction/discussion should be carried out for better understanding and management.

F. Attitudes including Communication Skills:

Should be able to communicate effectively with patients, colleagues and the community about genetic diseases as well as counsel patients and relatives about various decisions taken during management. The compassion, empathy, communication skills are intrinsic but vary in texture and amount amongst different persons. Though all physicians need these skills, their contribution is high for becoming a successful medical geneticist. These attitudes need to be developed and polished by observation, training and practice.

SUBJECT SPECIFIC COMPETENCIES

By the end of the course, the student should have acquired knowledge (cognitive domain), professionalism (affective domain) and skills (psychomotor domain) as given below:

A. KNOWLEDGE/COGNITIVE DOMAIN

By the end of the course, the post graduate student should have acquired knowledge in Core Discipline: Competencies unique to Medical Genetics

1. What genes are, how they are organized and controlled, what they do, and how they segregate, what is the structure and configuration of genome
2. The nature of mutations and pre-mutations and how they contribute to human variability and to disease
3. The patterns of inheritance characteristic of autosomal dominant, autosomal recessive, X-linked dominant and X-linked recessive traits
4. Factors that affect development of the phenotype in single-gene disorders, including variable expressivity and incomplete penetrance
5. The basis of mitochondrial diseases and the expected pattern for mitochondrial (maternal) inheritance, and other non-Mendelian form of inheritances like genomic imprinting, isodisomy, unstable/dynamic mutations, copy number variation, etc
6. Organization of genes chromosomes, how chromosomes replicate in mitosis and meiosis, and mode of their transmission from parent to child
7. Clinical manifestations of common numeric, structural and mosaic chromosomal anomalies
8. Concepts and clinical importance of genetic imprinting and uniparental disomy
9. Principles of population genetics and the public health implications of genetic epidemiology
10. Relevance of polymorphisms, gene linkage, and human gene mapping in medicine
11. The basic principles of inborn errors of metabolism and of pharmaco-genetic variations and their general clinical manifestations
12. The multi-factorial nature of human traits, both normal and abnormal, and the principles of multi-factorial inheritance
13. The mechanisms of teratogenesis and the effects of major human teratogens
14. Methods to recognize and classify congenital anomalies and the approach to diagnosis of multiple congenital anomaly syndromes

15. Role of genetics in the pathogenesis of neoplasms and in the predisposition to malignancies
16. Epigenetics
17. Use of evolutionary principles to understand human biology and disease
18. Disease frequency variations in different ethnic groups
19. Conventional as well as advanced molecular genetics, cytogenetics and metabolic genetic diagnostic techniques, and their application to genetic disorders
20. Techniques to study in vitro functional effects of genetic variations
21. Various databases of genes, genetic variations, genetic disorders and tools / software for studying effects of genetic variations, genotype phenotype correlations
22. Clinical presentations of organ specific genetic disorders and approaches to clinical phenotypes of genetic disorders
23. Traditional and novel approaches to the treatments of genetic disorders
24. The procedures available for prenatal & pre-implantation genetic diagnosis and the type of disease that can be detected prenatally/before implantation
25. Appropriate methods of genetic counseling
26. The advantages, limitations, and dangers of predictive testing for genetic disease
27. The existence of and justification for screening programs to prevent genetic disease
28. Approaches to screening for genetic diseases and concepts of personalized medicine
29. Organizational and economic aspects of the health care system with regard to genetics
30. Legal and ethical issues involved in the practice of medical genetics
31. Ability to recognize variations in human form (taking into account the features of the parents)
32. The history of use and misuse of human genetics

Problem Solving

The post graduate student should demonstrate ability to:

1. Take history including collecting complete family history in the form of a pedigree
2. Examine the patient for general findings, dysmorphism, systemic findings, evaluation of growth and development in a systematic way and with great sensitivity (examination of

parents, relatives for subtle findings, dysmorphism is a part of clinical evaluation of the patient. Evaluation of patient for dysmorphism and examination of relatives should be done with an extra sensitivity as this may psychological touchy points/ areas)

3. Interpret family history data
4. Identify and find information relevant to a clinical problem, using consultation, texts, and the archival literature and electronic media
5. Generate an initial list of differential diagnoses (including appropriate non-genetic disorders) given a specific complaint and patient characteristics
6. Re-rank the differential diagnoses based on information gathered from the history, physical, and auxiliary studies
7. Explain a mechanism for each aspect of a patient's problem, including biological, behavioral, and social aspects
8. Plan investigations and provide information about the need and utility of the genetic investigations along with the information about the diagnostic yield and limitations (also described as pretest counseling)
9. Providing appropriate information about phenotype of the patient in the form of Human Phenotype Ontology (HPO) terms to the laboratory while sending samples for genomic tests like cytogenetic microarray (CMA) and next generation sequencing (NGS)
10. Interpret the results of CMA, NGS. Reevaluate them based on various databases of variants, using software for pathogenicity testing and using guidelines and review of latest literature
11. Knowledge in the area of bioinformatics for DNA/ RNA interrogation
12. The results of the tests need clinical correlation and deep / reverse phenotyping after the results are available. Emphasis on Genetic results, as they are irreversible and heritable transmissions are known and are socially stigmatizing (important aspect in marriage counseling).
13. Evaluate scientific/clinical information and critically analyze conflicting data and hypotheses
14. Treat the patients with available modalities of treatment, look for latest drug developments

15. Communicate the diagnosis and uncertainties/limitations in diagnosis

Practice-Based Learning and Improvement

Physician Scholar

1. Demonstrates ability to analyze the quality and implications of medical literature and apply new knowledge in the delivery of health care
2. Demonstrates interest and ability to identify future areas of inquiry in medical genetics research
3. Demonstrates enthusiasm and positive attitude in the educational process and participates fully in educational activities
4. Demonstrates competency in use of genetic databases, software and bioinformatic tools
5. Write case summary and electronic health records for comprehensive data collection
6. Write referral notes to other specialists and primary care physician for continued management, surveillance for complications and sick day management

Health Care Management

1. Demonstrates **practical, efficient and cost-effective approach to screening, diagnosis and treatment** planning and recognizes its social and economic impact
2. Demonstrates ability to engage the patient family in diagnosis and therapeutic treatment planning
3. Demonstrates ability to recognize and outline initial treatment for patient with life threatening emergencies regardless of etiology
4. Consent should be informed written consent from the patient in the language they understand (English and vernacular) and records should be kept as per PCPNDT guidelines

Health Service Delivery

1. Demonstrates knowledge of health-care financing and applies it in assisting patient to access the best possible care
2. Utilizes knowledge of population based and evidence-based medicine in making patient management decisions

3. Works with patient support groups in the area of advocacy and as a communicator with the policy makers
4. Utilizes knowledge of managed care systems in making patient treatment plans and health care maintenance plans

Health Care Team approach to health care delivery

1. Demonstrates understanding of the roles and competencies of other health care providers
2. Demonstrates ability to engage with other health care professionals
3. Demonstrates training, allotment of work and supervision of paramedical workers like genetic counselor, social worker, genetic nurse, medical photographer
4. Demonstrates ability to follow and lead in a team approach to health care delivery

Academic Skills

1. Familiarity with basic research methodology, epidemiology, basic information technology skills, knowledge to access data and information systems, electronic health records
2. Writing a proposal for submission to Ethics Committee
3. Preparing Case Report Form for various presentations
4. Planning the protocol of a thesis, its execution and final report
5. Review of literature
6. Conducting clinical sessions for undergraduate medical students, nurses and paramedical workers
7. Writing and presenting a paper
8. Writing patient information brochures in local languages

B. AFFECTIVE DOMAIN

The post graduate student should:

1. Be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion

2. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion
3. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching

Professionalism

1. Accepts personal responsibility for care of patients with genetic disorder, consistent with good work ethics and empathy
2. Demonstrates appropriate truthfulness and honesty with colleagues
3. Recognize personal beliefs, prejudices, and limitations, which should not come in the way of providing service
4. Respect patient confidentiality at all times in verbal and written communication

Interpersonal and Communication Skills

Human Relationships

1. Demonstrate an effective system for identifying and addressing ethical, cultural, and spiritual issues associated with health care delivery
2. Demonstrate knowledge or applies an understanding of psychological, social, and economic factors which are pertinent to the delivery of health care
3. Accurately assess a patient's assumptions in accessing the health care system
4. Effectively engage the patient and/or family in communications
 - a. Non-judgmental and non-coercive
 - b. Non-directive in genetic counselling

Attitudes

1. Appreciate the importance of disease prediction and prevention
2. Respect patients' religious, moral, and ethical beliefs and biases, even if they differ from the student's own beliefs
3. Present all available options accurately and non-directively

4. Be aware of both the importance of confidentiality and the difficulties that confidentiality poses when relatives are found to be at risk for a serious and potentially preventable disease
5. Be aware of the advantages and potential hazards of referring patients and families to community or national resources
6. Recognize the limitations of their own skills and seek consultation when necessary

C. PSYCHOMOTOR DOMAIN

The post graduate student must acquire the following practice-based competencies/skills:

1. Acquire ability to elicit medical history of the patient, including developmental and reproductive history
2. Ability to elicit the family history, including drawing of detailed pedigree chart
3. Ability to conduct physical examination of affected and related individuals (including examination of the affected fetus where required), with special emphasis on morphological features (with sensitivity and subtly, without offending the patient or parents' sensitivity about body image and dysmorphism) and anthropometric measurements and proper documentation of the findings, including photographs
4. Follow a logical approach in syndrome identification including the use of diagnostic aids e.g. computer assisted diagnosis, literature search, image analysis software, etc
5. Use the diagnostic support of the software logically using subjective interpretations and review of latest literature
6. Recognize psycho-social and economic implications of the genetic problem in the family
7. Integrate the clinical & genetic information to exclude the non-genetic causes of the clinical presentation (phenocopy) and formulate an appropriate differential diagnosis of genetic causes related to the case
8. Understand the uses, limitations, interpretation and significance of specialized laboratory procedures and formulate an appropriate plan for medical consultations and investigations, and conduct pre-test counseling with the family
9. Obtain samples for genetic studies e.g. skin biopsy (after obtaining the informed consent), requisition/conduct tests, medical consultations

10. Acquire skills to conduct all required cytogenetic, biochemical and laboratory tests, and discuss the results with clinician-in-charge of the patient to arrive at a logical conclusion on the disease and its management
11. Explain the diagnosis, etiology, natural history, and management of the condition to the patient and the family in a way that is comprehensible to the patient and family
12. Provide general, supportive and specific medical care to the patient including appropriate interventions where necessary
13. Provide client-centered counseling and anticipatory guidance
14. Provide psychosocial support including (a) areas of difficulty and conflict, (b) help families and individuals recognize and cope with their emotional and psychological needs, and (c) recognize situations requiring psychiatric referral
15. Identify and use community resources that provide medical, educational, financial and psychosocial support and advocacy
16. Determine the mode of inheritance and risk of occurrence and recurrence of the genetic condition/birth defect, and give appropriate information on the same to the patient and family, including availability of antenatal diagnosis and other reproductive options
17. Promote informed decision-making about further testing and management of the risk of occurrence/recurrence, including provision of antenatal diagnosis, if possible
18. Provide written documentation of medical, genetic and counseling information for families and other health professionals
19. Communicate to the patient / relatives at a level appropriate to the consultant, information concerning the medical implications and prognosis, the risks that apply, the options available, and to help the individual/ family choose an appropriate course of action for themselves
20. Identify psychosocial issues in the family and if need arises refer to a psychiatrist for evaluation and assistance
21. Acquire necessary management skills to coordinate the care of individuals affected with complex genetic conditions that will require a long-term multidisciplinary approach
22. Demonstrate mastery of adequate medical record keeping.

Syllabus

Course contents:

A. Cognitive domain

History of Medical Genetics

- Foundations of Medical Genetics Before 1956

- Growth and Development of Medical Genetics: 1956 to the Present

- The Future

Genetics in Medicine

- The Principles of Disease, Defining Disease, Prevention and Treatment

Nature and Frequency of Genetic Disease

- Frequency of Genetic Disease

- Single-Gene Disorders

- Multifactorial Disorders

- Somatic Cell Genetic Disorders

Genomics and Proteomics

- Genes and Human Disease

- Genomics

- Mapping the Human Genome

- Sequencing the Human Genome

- Current Approaches to Sequence Human Genome

- Cloning Human Disease Genes

- Sequence-Based Methods for Detecting Chromosomal Abnormalities

- Proteomics

Genome and Gene Structure

- Double Helix Structure, DNA Replication, Transcription, and Meiotic Recombination

- Organization of Genomic DNA

- Gene Structure and the Molecular Pathway of Gene Expression

Epigenetics

- Epigenetic Mechanisms: Chromatin, DNA Methylation and Long Noncoding RNAs

- Epigenetic Reprogramming

- Epigenetic Regulation of X Inactivation

- Genomic Imprinting

- Genetic Disorders Due to Genes Affecting Chromatin Structure

- Methods for Studying Epigenetic Marks

- Cancer Epigenetics

- Environmental Influences on Epigenetic Traits

- Abnormalities in Epigenetic Programming Linked to Infertility and ART

In Utero Epigenetic Programming of Adult Traits and Disease
Genetic–Epigenetic Interactions

Human Gene Mutation in Inherited Disease: Molecular Mechanisms and Clinical Consequences
Molecular Mechanisms of Mutation Causing Human Inherited Disease
Disease-Causing Mutations, Consequences of Mutations
General Principles of Genotype–Phenotype Correlations

Genes in Families

Pedigree Construction
Unifactorial Inheritance/Single-Gene Disorders
Dominance and Recessiveness
Autosomal-Dominant Inheritance
Autosomal Recessive Inheritance
Sex-Linked Inheritance
X-Linked Recessive Inheritance
X-Linked Dominant Inheritance
Y-Linked (Holandric) Inheritance
Partial Sex Linkage

Analysis of Genetic Linkage

Linkage Analysis: Basic Concepts
Extending Parametric Linkage Analysis
Linkage Analysis for Complex and Quantitative Traits

Chromosomal Basis of Inheritance

Chromosome Structure, Chromosomes in Cell Division
Methods for Studying Human Chromosomes
Functional Organization of Chromosomes
Sex Chromosomes and Sex Determination
Uniparental Disomy and Imprinting
Chromosome Abnormalities

Mitochondrial Genetics

Mitochondrial Biology and Genetics
Mitochondrial Etiology for Diseases and cancer
Therapeutic Approaches to Mitochondrial Disease

Multifactorial Inheritance and Complex Diseases

Determining the Genetic Component of a Trait
The International HapMap Project
Genome-Wide Association Studies
Association Methods/Statistical Analysis
Analysis of Rare Variants Using New Technologies
Integration of Genetic, Genomic, and Functional Data for Multifactorial Diseases

Population Genetics

Hardy–Weinberg Law, Factors that affect Hardy–Weinberg Equilibrium

Applications in Population Genetics

Pathogenetics of Disease

The Scope of Abnormal Phenotypes: Disease and Malformation

Multivariate Normal Distributions and the Threshold Model

Pathogenetics of Refined Traits

Molecular Pathogenetics

Human Developmental Genetics

The Concept of Developmental Fields and Field Defects

Cellular Signaling in Development

Steps and Concepts in Embryonic Development

Regulation of Gene Expression in Development

Organogenesis

Twins and Twinning

Determining Zygosity

Incidence of Twins, Vanishing Twin, Structural Defects in Twins

Twins in Genetic Studies

Dizygotic Twins, Monozygotic Twins

The Molecular Biology of Cancer

Genetic Basis of Cancer

Viral Oncogenes

Oncogenic Alleles in Human Cancers

Tumor Suppressor Genes

The Role of DNA Damage Repair Genes in Inherited Cancer Syndromes

The Biological Basis of Aging: Implications for Medical Genetics

Progeroid Syndromes of Humans

Human Allelic Variants Homologous to Pro-Longevity Genes

Pharmacogenetics and Pharmacogenomics

Classical Genetics and Pharmacogenetics

Ethnic Differences in Gene–Drug Interactions

Pharmacogenomics

Genetic Evaluation for Common Diseases of Adulthood

The Process of Genetic Evaluation for Common Diseases

Integrating Genetic Information into Routine Clinical Practice

Genetic Counseling and Clinical Risk Assessment

Process of Genetic Counseling

Adult-Onset Disorders
Genetic Risk Assessment and Calculation in the Clinical Setting

Cytogenetic Analysis

Milestones in Human Cytogenetics
The Indications for Cytogenetic Analysis
Tissue Samples and Cell Culture, Chromosome Banding
The Normal Human Karyotype
Chromosome Abnormalities
In situ Hybridization

Diagnostic Molecular Genetics

Indications for Molecular Genetic Testing
Technical Approaches to Molecular Genetic Testing
Molecular Genetic Diagnosis of Diseases
Mitochondrial DNA Disorders
Quality Assurance, and Regulatory Issues
Internet Resources for Molecular Genetic Testing

Heterozygote Testing and Carrier Screening

Carrier Screening in Clinical Practice
Carrier Screening in Individuals of Defined Subpopulation Groups
Therapeutic Implications for Heterozygotes
Methods and Tissues used in Carrier Identification
Problems in Heterozygote Detection
Sensitivity and Specificity, Cost and Feasibility
Age for Carrier Testing

Prenatal Screening for Neural Tube Defects and Aneuploidy

Techniques for Prenatal Diagnosis

Amniocentesis, Chorionic Villus Sampling, Fetal Blood Sampling, Fetal Tissue Sampling, Celomocentesis
Embryoscopy
Polar Body Biopsy, Preimplantation Genetic Diagnosis
Ultrasonography
Fetal Cells and Fetal DNA in Maternal Blood

Neonatal Screening

Historical Aspects
Components of Screening Programs
Potential Problems in Newborn Screening
Disorders and Conditions Detected by Newborn Blood Screening
Other Newborn Screening and Issues and Concerns in Screening

Therapies for Lysosomal Storage Diseases

- ERT for Lysosomal Storage Diseases
- Substrate Reduction Therapy
- Pharmacologic Chaperone Therapy

Gene Therapy: From Theoretical Potential to Clinical Implementation

- Genes as Medicines -The Origins of Gene Therapy
- The Basic Science: Gene Transfer
- Developing Cell-Type-Specific and Regulatable Gene Delivery Vectors
- The Clinical Science: Toward Gene Therapy of Human Disease

Ethical and Social Issues in Clinical Genetics

- Genetic Counseling, Testing and Screening
- Goals and Outcomes of Genetic Services
- Non-directiveness in Genetic Counseling
- Diagnostic Genetic Testing, Predictive Genetic Testing
- Confidentiality
- Genetic Testing in Childhood, Population Genetic Screening, Newborn Screening, Antenatal Screening, Carrier Screening
- Genetics, Geneticization and Society
- Reproductive Technologies and Cloning: “Reprogenetics”

Legal Issues in Medical Genetics

- Genetic Malpractice
- Genetic Counseling, Abortion, Adoption, Surrogacy, Embryo cryopreservation
- Newborn Screening
- Prenatal and Carrier Screening
- Genetic Discrimination
- Regulation of Genetic Diagnostic Tests
- Direct to Consumer Genetic Testing
- Regulation of Human Genetic Research
- Regulation of Research with Stem Cells Derived from Human Embryos

Genetics of Male & Female Infertility

- The Hypothalamic – Pituitary - Gonadal Axis
- Hypogonadism: Hypogonadotropic & Hypergonadotropic Hypogonadism
- Eugonadal Infertility
- Chromosome Anomalies and Gene defects

Fetal Loss

- Early Pregnancy Loss, Late Pregnancy Loss
- Evaluation and Management of Recurrent Abortion

Clinical Approach to the Dysmorphic Child

- Prenatal versus Postnatal Onset of Developmental Problems

Clinical Teratology

- Recognized Teratogenic Exposures
- Paternal Exposures and Maternal Exposures

Neurodevelopmental Disabilities: Global Developmental Delay, Intellectual Disability, and Autism

Abnormal Body Size and Proportion

- Pathologic Short Stature
- Pathologic Overgrowth

Susceptibility and Response to Infection

- Genome-Wide Association Studies and Human Infection
- Cell Surface Proteins, Intracellular Proteins, Extracellular Proteins

Transplantation Genetics

- The Physiologic Function of MHC Molecules
- The Structure of Human Histocompatibility Molecules
- Minor Histocompatibility Systems
- Serologic, Cellular and Molecular Methods for HLA Typing
- Clinical Significance of HLA Molecular Typing
- Genetics of Xenotransplantation
- Stem Cells and Transplantation

The Genetics of Disorders Affecting the Premature Newborn

- Respiratory Distress Syndrome, Bronchopulmonary Dysplasia
- Patent Ductus Arteriosus
- Intraventricular Hemorrhage
- Retinopathy of Prematurity
- Necrotizing Enterocolitis

Disorders of DNA Repair and Metabolism

- Disorders of Nucleotide Excision Repair: Xeroderma Pigmentosum and Cockayne Syndrome
- Disorders of Base Excision Repair: MUTYH and Colon Cancer Risk
- Disorders of Mismatch Repair: Lynch Syndrome and Turcot Syndrome
- Disorders Associated with Double Strand Break Recognition and Repair: Ataxia-Telangiectasia and Related Conditions
- Crosslink Repair and Homologous Recombination Defects: Breast–Ovarian Cancer and Fanconi Anemia
- Disorders Associated with Recq Helicase Deficiency: Bloom, Werner, and Rothmund–Thomson Syndromes
- Gene - Environment Interactions: Gorlin - Goltz Syndrome

Autosomal Abnormalities

- Genetic Counseling in the Trisomies

Down Syndrome (Trisomy 21), Trisomy 18, Trisomy 13
Translocations
Uniparental Disomy
Deletion, Duplication

Sex-Chromosome Abnormalities

Turner Syndrome, Klinefelter Syndrome, 47,XXX Syndrome, 47,XYY Karyotype
Sex Chromosome Mosaicism
Sex Chromosome Tetrasomy and Pentasomy (Polysomy)
Structural Abnormalities of the Y Chromosome
Prenatal Diagnosis of Sex Chromosome Abnormalities

Cardio-vascular system: Congenital Heart Defects and Inherited Cardiomyopathies

Specific Syndromes with Congenital Heart Defect
Chromosomal Disorders
Microdeletions/Microduplication Syndromes
Single-Gene Disorders
Holt–Oram syndrome
CHARGE Syndrome
Maternal Diabetes, Drug Ingestion
Folic Acid Supplementation
Risks for Sibs and Offspring of Children with Isolated Heart Defects
Hypertrophic, Dilated and Atypical Cardiomyopathy
Hereditary Hemorrhagic Telangiectasia (Osler–Weber–Rendu Syndrome)
Hereditary Disorders of the Lymphatic System and Venous System (varicose vein)
Capillary Malformation/Arteriovenous Malformation (Capillary Malformation, Sturge–Weber Syndrome, Capillary Malformation–arteriovenous Malformation, Cerebral Cavernous Malformation)
The Genetics of Cardiac Electrophysiology in Humans
Genetics of Blood Pressure Regulation
Preeclampsia
Common Genetic Determinants of Coagulation and Fibrinolysis (Genetic Variants Influencing Components of the Coagulation Cascade, Genetic Variants Influencing Natural Anticoagulants, Genetic Variants Influencing Components of the Fibrinolytic Cascade, Genetic Variants Influencing Platelet Function, Genome-Wide Association Analysis for Thrombosis)
Genetics of Atherosclerotic Cardiovascular Disease (Genetic Studies of CHD, Candidate Gene Studies in Humans, Genome Wide Association Studies, GWAS Findings for CVD Risk Factors, Genetic Risk Scores and Prediction Algorithms for Personalized Medicine)

Respiratory tract disorders

Cystic Fibrosis
Genetic Underpinnings of Asthma and Related Traits
Disorders of ciliary function
Hereditary Pulmonary Emphysema
Interstitial and Restrictive Pulmonary Disorders

Congenital Anomalies of the Kidney and Urinary Tract

- Cystic Diseases of the Kidney
- Nephrotic Disorders
- Renal Tubular Disorders
- Cancer of the Kidney and Urogenital Tract

Gastrointestinal Tract and Hepatobiliary Duct System

- Inflammatory Bowel Disease
- Bile Pigment Metabolism and its Disorders including cholestasis
- Cancer of the Colon and Gastrointestinal Tract

Blood

- Hemoglobinopathies and Thalassemia
- Other Hereditary Red Blood Cell Disorders
- Hemophilia and Other Disorders of Hemostasis
- Rhesus and Other Fetomaternal Incompatibilities
- Disorders of bone marrow aplasia and dyserythropoiesis

Immunologic Disorders: Autoimmunity: Genetics and Immunologic Mechanisms

- Immunodeficiency Disorders
- Inherited Complement Deficiencies
- Disorders of Leukocyte Function
- Genetic Basis of Autoimmune Thyroid Disease

Endocrine

- Abnormalities of growth hormone- pituitary axis
- Monogenic diabetes mellitus
- Susceptibility to type I and type II diabetes
- Genetic Basis of Thyroid Carcinoma
- Familial Hypocalciuric Hypercalcemia
- CASR Mutations in Familial Hypocalciuric Hypercalcemia and Neonatal Severe Hyperparathyroidism
- Neonatal Hyperparathyroidism
- Multiple Endocrine Neoplasia
- Familial Isolated Hypoparathyroidism
- NHERF1 Mutations and Renal Responsiveness to Parathyroid Hormone

Adrenal Gland

- Congenital Adrenal Hyperplasia (21, 11 β , 3 β , 17 α -Hydroxylase Deficiency, 17,20-Lyase Deficiency, Congenital Lipoid Adrenal Hyperplasia, etc): Prenatal Diagnosis and Treatment
- Congenital adrenal hypoplasia

Reproductive system

- Disorders of the Gonads, Genital Tract, and Genitalia
- Disorders of Sexual Development and differentiation

Hereditary Cancers

- Familial Breast Cancers (BRCA1, BRCA2)
- Familial Breast or Ovarian Cancer
- Familial Ovarian Cancer
- Familial Endometrial Cancer
- Hereditary Nonpolyposis Colorectal Cancer Syndrome (or Lynch Syndrome)
- Li Fraumeni syndrome

IEM Amino Acid Metabolism

- Disorders of Phenylalanine Metabolism
- Disorders of Tyrosine Metabolism
- Disorders of Glycine Metabolism
- Disorders of Proline and Hydroxyproline
- Disorders of the Urea Cycle and Ornithine
- Disorders of Serine Metabolism

IEM Disorders of Carbohydrate Metabolism

- Disorders of Galactose Metabolism
- Disorders of Fructose Metabolism
- Disorders of Pentose Metabolism
- Glycogen Storage Diseases
- Gluconeogenic Disorders Associated with Lactic Acidosis

Congenital Disorders of Protein Glycosylation

- Congenital Disorders of Protein N-Glycosylation
- Congenital Disorders of Protein O-Glycosylation
- Congenital Disorders of Protein N- and O-Glycosylation

Purine and Pyrimidine Metabolism

Lipoprotein and Lipid Metabolism

- Monogenic Disorders of Lipoprotein Metabolism
- Disorders with Primarily Elevated LDL Cholesterol
- Disorders with Primarily Depressed LDL Cholesterol
- Disorders with Primarily Elevated HDL Cholesterol
- Disorders with Primarily Depressed HDL Cholesterol
- Disorders with Primarily Elevated Triglycerides
- Disorders with Multiple Lipoprotein Disturbances

Organic Acidemias and Disorders of Fatty Acid Oxidation

Organic Acidemias

Vitamin D Metabolism or Action

- Hereditary Vitamin D Dependency Type 1 (VDDR-1)-1- α -Hydroxylase Deficiency
- Hereditary Vitamin D-Dependent Rickets Type 2 (VDDR-2)
- States Resembling Hereditary Generalized Resistance to 1,25(OH)₂D

Inherited Porphyrrias

- Regulation of Heme Biosynthesis

- Classification and Diagnosis of the Porphyrrias

Inherited Disorders of Human Copper Metabolism

- Menkes Disease

- Wilson Disease

Iron Metabolism and Related Disorders

- Syndromes of Iron Overload

- Other Disorders Resulting in Derangements of Iron Handling

Mucopolysaccharidoses

- Mucopolysaccharidosis I (IH Hurler, IS Scheie and IH/S Hurler–Scheie Disease)

- Mucopolysaccharidosis II (Hunter Syndrome)

- Mucopolysaccharidosis IIIA (Sanfilippo Syndrome, MPS IIIA)

- Mucopolysaccharidosis IIIB (Sanfilippo Syndrome, MPS IIIB)

- Mucopolysaccharidosis IIIC (Sanfilippo Syndrome, MPS IIIC)

- Mucopolysaccharidosis IIID (Sanfilippo Syndrome, MPS IIID)

- Mucopolysaccharidosis IVA and IVB (Morquio Syndrome, MPS IVA, MPS IVB)

- Mucopolysaccharidosis V (Scheie Syndrome, MPS V)

- Mucopolysaccharidosis VI (Maroteaux–Lamy Syndrome, MPS VI)

- Mucopolysaccharidosis VII (Sly Syndrome, MPS VII)

- Mucopolysaccharidosis VIII

- Mucopolysaccharidosis IX (Natowicz Syndrome, MPS IX)

Oligosaccharidoses: Disorders Allied to the Oligosaccharidoses

Sphingolipid Disorders and the Neuronal Ceroid Lipofuscinoses or Batten Disease (Wolman Disease, Cholesteryl Ester Storage Disease, and Cerebrotendinous Xanthomatosis)

- GM1-Gangliosidosis (β -Galactosidosis)

- GM2-Gangliosidosis

- Loss-of-Function Mutation of GM3-Synthase

- Niemann–Pick Disease

- Niemann–Pick Disease, Types A and B

- Niemann–Pick Disease, Types C and D

- Farber’s Disease

- Acid Lipase Deficiency (Wolman Disease and Cholesteryl Ester Storage Disease)

- Gaucher Disease

- Galactosylceramide Lipidosis, Globoid Cell Leukodystrophy, or Krabbe Disease

- Metachromatic Leukodystrophy

- Fabry Disease

- Neuronal Ceroid Lipofuscinosis or Batten Disease

- Kufs Disease or Adult NCL

- Congenital NCL/CNCL-CLN10/Cathepsin D or CTSD Deficiency

Peroxisomal Disorders

Nervous System (CNS & PNS)

- Fragile X Syndrome and X-linked Intellectual Disability
- Dyslexia and Related Communication Disorders
- Attention-Deficit/Hyperactivity Disorder
- Autism Spectrum Disorders
- Genetics of Alzheimer Disease
- Schizophrenia and Affective Disorders
- Addictive Disorders
- Neural Tube Defects
- Genetic Disorders of Cerebral Cortical Development
- Genetic Aspects of Human Epilepsy
- Basal Ganglia Disorders (Parkinson Disease, Dystonias, Choreic Disorders)
- Hereditary Ataxias (Autosomal-Dominant, Recessive, X-linked ataxias, Intermittent Ataxias, Episodic Ataxias, Progressive Ataxias, Mitochondrial Ataxias)
- Hereditary Spastic Paraplegia (Autosomal Dominant, Autosomal Recessive, X-Linked)
- Autonomic and Sensory Disorders (Familial Dysautonomia, Congenital Sensory Neuropathy with Anhidrosis)
- The Phakomatoses (The Neurofibromatoses)
- Tuberous sclerosis
- Demyelinating Disorders (Krabbe Disease, Metachromatic & X-Linked Adrenoleukodystrophy)
- Hereditary Motor and Sensory Neuropathies (Charcot–Marie–Tooth)
- Spinal Muscular Atrophies
- Motor Neuron Disease: Familial Amyotrophic Lateral Sclerosis

Muscles

- Muscular Dystrophies (Dystrophinopathies, Facioscapulohumeral Muscular Dystrophy Emery–Dreifuss Muscular Dystrophies and Other Contractural Phenotypes, Limb-Girdle Muscular Dystrophies, Myofibrillar Myopathies and Other Distal Phenotypes, Congenital Muscular Dystrophies)
- Congenital (Structural) Myopathies
- Hereditary Muscle Channelopathies
- Myotonic Dystrophies
- Hereditary and Autoimmune Myasthenias

Eye

- Color Vision Defects (Molecular Basis of Variation in Normal Color Vision, Genetics of Red–green Color Vision in Women, Blue–Yellow (Tritan) Color Vision Defects, etc)
- The Achromatopsias
- Optic Atrophy
- Glaucoma
- Congenital Defects of the Cornea
- Congenital Cataracts and Genetic Anomalies of the Lens

Hereditary Retinal and Choroidal Dystrophies: Pigmentary Retinopathies/Retinitis Pigmentosa, Leber's Congenital Amaurosis, The Primary Cone Degenerations
Strabismus
Retinoblastoma and the RB1 Cancer Syndrome
Anophthalmia, Microphthalmia, and Uveal Coloboma

Ear: Hereditary Hearing Impairment

Clefting, Dental, and Craniofacial Syndromes

Craniosynostosis

Skin and Hair

Abnormalities of Pigmentation: Disorders of Melanosome Biogenesis/Transport—Hermansky–Pudlak Syndrome, Chédiak–Higashi Syndrome, and Griscelli Syndrome; Disorders of Melanocyte Survival—Vitiligo
Ichthyosiform Dermatoses
Epidermolysis Bullosa
Ectodermal Dysplasias
Xeroderma Pigmentosum
Epidermodysplasia Verruciformis
Porokeratoses
Muir–Torre Syndrome
Melanoma
Cutaneous Hamartoneoplastic Disorders: Hereditary Leiomyomatosis and Renal-Cell Cancer, Birt–Hogg–Dubé Syndrome
Inherited Disorders of the Hair: Hypotrichosis, Hypertrichosis
Marfan Syndrome and Related Disorders
Ehlers–Danlos Syndrome
Heritable Diseases Affecting the Elastic Fibers: Cutis Laxa, Pseudoxanthoma Elasticum, and Related Disorders

Bone

Osteogenesis Imperfecta (and Other Disorders of Bone Matrix)
Disorders of Bone Density, Volume, and Mineralization: Osteopetrosis Group of Disorders, Raine Dysplasia, Pyknodysostosis, Dysosteosclerosis, Osteopoikilosis, Craniotubular Remodeling Disorders, Hyperphosphatasemia with Osteoectasia, etc
Chondrodysplasias
Abnormalities of Bone Structure (Dysplasia Epiphysealis Hemimelica, Hereditary Multiple Exostoses, Langer–Giedion Syndrome, Enchondromatosis, Maffucci Syndrome, Metachondromatosis, Fibrous Dysplasia of Bone, etc)
Dysostoses
Arthrogryposes (Multiple Congenital Contractures)
Common Skeletal Deformities
Hereditary Noninflammatory Arthropathies
Cohesinopathies

Ciliopathies

B. Psychomotor domain:

The student should be able to understand, learn and/or perform:

1. Elicit a comprehensive medical genetic history and construct an appropriate pedigree
2. Carry out a comprehensive physical examination for major and minor anomalies, with special attention to surface anatomy and anthropometric measurements
3. Understand prenatal diagnostic procedures both invasive (amniocentesis, chorionic villous sampling, cordocentesis, etc) and non-invasive (fetal ultrasonography)
4. Perform fetal autopsy
5. Understand principle of cytogenetic, biochemical, and molecular laboratory methods
6. Perform specialized tests through biochemical, cytogenetic, and molecular genetic laboratories
7. Learn interpretation of cytogenetic, biochemical, and molecular laboratory reports
8. On the basis of results, formulate an appropriate diagnosis
9. Effectively use information systems, including library and electronic resources, in the evaluation and management of patients with genetic diseases, including diagnosis of multiple congenital anomaly syndromes, and the recognition of teratogenic exposures.
10. Ensure that the testing is done in an Accredited Lab Only (Authenticity and legal protection for the referring clinician). Interpretation of the results is an art and science and hence should be included empathetically.
11. Appreciate the role of biomedical research and develop techniques for critical analysis of current scientific developments
12. Able to coordinate information from multiple sources into a coherent and rational plan of management of genetic disorders
13. Able to communicate and counsel patients and families who sometimes may be disturbed and psychologically upset
14. Understand human behavior, maturation, and intelligence, in order to facilitate counseling of varying individuals

Management of genetic diseases

The student should be able to:

1. Provide patients with access to diagnostic and predictive tests that are appropriate for the condition in their family and advise patients of the benefits, limitations, and risks of such tests.
2. Demonstrate use and correct interpretation of diagnostic procedures and their results
3. Advise appropriate treatments, including dietary, pharmacological, enzyme-replacement, transplantation, and gene therapy.
4. Communicate genetic information in a manner that is suitable for each particular patient and family. Present all available option accurately with consequences explained and non directively.
5. Tolerate and encourage reiteration of information because of patient anxiety or unfamiliarity with the concepts being presented
6. Apply appropriate communication techniques for conveying bad news
7. Recognize patients' defense mechanisms and be able to determine when it is better to leave them intact and when they may need to be breached
8. Cope emotionally with responses of patients
9. Interpret their own attitudes toward ethical, social, cultural, religious, and ethnic issues and develop an ability to individualize each patient or family member.
10. Resolve varying cultural, social, and religious attitudes in relation to issues such as contraception, abortion, parenting, and gender roles
11. Utilize community support services and agencies appropriately
12. Plan and give an appropriate surveillance/ follow-up monitoring plan for anticipated complications and issues
13. Understand all the associated and anticipated multisystem manifestations in order to refer for appropriate multidisciplinary management
14. Participate in treating genetic diseases where applicable; for eg.,Lysosomal Storage Diseases (enzyme replacement, substrate reduction & Pharmacologic Chaperone Therapy), hypophosphatemia (burosumab), Multiple Exostoses (palovarotene), Metaphyseal Chondrodysplasia Schmid type (carbamazepine), Osteoporosis Pseudoglioma (lithium carbonate).

TEACHING AND LEARNING METHODS

Clinical Training

Clinical training must provide students with opportunities to have first-hand experience with individuals and families affected by a broad range of genetic disorders. These clinical experiences must expose post graduate students to the natural history and management of common genetic conditions and birth defects and to relevant psychosocial issues. Students must have the opportunity to develop counseling and psychomotor skills in a variety of clinical settings where genetic services are provided. Such settings must include those where patients are seen for prenatal diagnosis; clinical and laboratory diagnosis of genetic syndromes and mental retardation; multidisciplinary management of chronic genetic disorders and birth defects; newborn, carrier or predisposition screening and evaluation of mutagenic, teratogenic or other risk factors. These clinical experiences must help students to observe and practice skills relating to obtaining medical and family histories; determining risks; performing psychosocial assessments; communicating information about disease characteristics, inheritance and natural history; providing anticipatory guidance and supportive counseling; identifying and using medical and community resources; communicating information to other health-care professionals, case management and follow-up. The students should become proficient in communicating the genetic burden and reproductive options including antenatal diagnosis to the patient and relatives.

Students must be supervised by qualified genetics professionals and given the opportunity for involvement in a variety of cases. Throughout clinical posting, student should maintain clinical/case management records in log book.

Rotation: Postings:

- 24 months of training in a clinical genetic unit where the post graduate student should participate in the care of at least 100 patients with various genetic disorders besides three months posting in fetal medicine, obstetrics & neonatology/pediatrics
- 12 months of posting in Genetics laboratory

Laboratory Training

The students must attain proficiency in carrying out prescribed list of laboratory tests themselves and attain overall ability to organize, supervise and report on results of various specialized genetic

laboratory investigations employed in workup of patients with genetic disorders (this posting may run concurrently with clinical training). For this purpose, laboratory posting should be scheduled as given below:

- a) 2 months of training in Cytogenetics including molecular cytogenetic techniques namely FISH (fluorescence *in situ* hybridization), microarray, QF PCR, MLPA
- b) 2 months of training in biochemical genetics including Newborn Screening
- c) 2 months of training in molecular genetics including PCR, Sanger sequencing, analysis of Next Generation Sequencing data, reverse transcription PCR (RT PCR), Real Time PCR
- d) 6 months Research Project work

These rotations shall focus not only on developing consultative/interpretive skills, but also will provide adequate opportunity for hands-on training. The time spent in the laboratory towards research project should be entered in Log book. During postings, students should be exposed to the following laboratory techniques:

- Cytogenetics including Prenatal Cytogenetic Diagnosis
- Molecular Cytogenetics including Prenatal, Preimplantation and Cancer
- Microarray including molecular karyotyping
- Molecular Techniques including Polymerase Chain Reaction (PCR), Gel Electrophoresis (DNA/RNA i.e., ribonucleic acid, Protein, etc), Southern blotting, Arms technique, Real Time PCR, Quantitative Fluorescent PCR (QF PCR), DNA Sequencing, next generation sequencing (NGS), epigenetics techniques,

Teaching methodology

1. This should include regular case presentations, didactic lectures, seminars, journal clubs, clinical meetings, and combined conferences with allied departments. Hours of lecture must be 6-8 hours a week as doctors undergoing this training are not exposed to basic genetics in their basic graduation
2. The post graduate student should be given the responsibility of managing and caring for patients in a gradual manner under supervision.
3. Department should encourage e-learning activities.
4. Formal teaching sessions

In addition to bedside teaching rounds, at least 5-hr of formal teaching per week are necessary. The departments may select a mix of activities as given under formative assessment. The students should also attend:

- Attend accredited scientific meetings (CME, symposia, and conferences).
 - Additional sessions on basic sciences, biostatistics, research methodology, teaching methodology, hospital waste management, health economics, medical ethics and legal issues related to medical practice.
4. There should be a training program on Research methodology for existing faculty to build capacity to guide research.
 5. The post graduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.
 6. A post graduate student of a post graduate degree course in broad specialities/super specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his post graduate studies so as to make him eligible to appear at the post graduate degree examination.
 7. **Log book:** During the training period, the post graduate student should maintain a Log Book indicating the duration of the postings/work done. This should indicate the procedures assisted and performed, and the teaching sessions attended. The Log book shall be checked and assessed periodically by the faculty members imparting the training.

Research work

Research Project: Every post graduate student shall carry out research work on assigned research project under the guidance of a Post Graduate Teacher, the result of which shall be written up and submitted to the institution. Ensure that the topics are selected to focus on genetic disorders in India (common and rare)

During the training programme, patient safety is of paramount importance; therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, provision of skills laboratories in medical colleges

is mandatory. Various basic courses organized by the Institute for all round development of the clinician should be attended for increasing knowledge.

ASSESSMENT

FORMATIVE ASSESSMENT, during the training program

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self-directed learning and ability to practice in the system.

General Principles

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and clinical examination.

Quarterly assessment during the MD training should be based on:

1. Journal based / recent advances learning
2. Patient based /Laboratory or Skill based learning
3. Self-directed learning and teaching
4. Departmental and interdepartmental learning activity
5. External and Outreach Activities / CMEs

The student to be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I).

SUMMATIVE ASSESSMENT, i.e., assessment at the end of training

The summative examination would be carried out as per the Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000.

The final examination will be in three parts:

1. Thesis

Every post graduate student shall carry out work on an assigned research project under the guidance of a recognized Post Graduate Teacher, the result of which shall be written up and

submitted in the form of a Thesis. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the post graduate student to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

2. Theory Examination:

The examinations shall be organized on the basis of 'Grading' or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training. The examination for MD/MS shall be held at the end of third academic year.

There shall be four Theory papers.

Paper I: Basic Sciences as applied to Genetics

Paper II: Clinical Genetics
(e.g., approach to genetic disorder diagnosis, counseling and management)

Paper III: Applied/Laboratory Genetics
(e.g., genetics of various organ systems disorders, pre-implantation genetic screening/diagnosis, non-invasive prenatal screening, prenatal diagnosis, chromosomal microarray in dysmorphology, next generation sequencing, gene panel test, diagnosis of triplet repeat disorder, common and rare genetic disorders in India)

Paper IV: Recent Advances in Genetics

3. Clinical/Practical Examination

Clinical Case Presentation:

Long Case: 1

Short Cases: 3

Genetic Counseling

Laboratory tests/other skills (10 tests/skills): (including OSCE / OSPE stations)

- Cytogenetics: slide reporting
- Molecular Cytogenetics: slide reporting
- DNA electrophoresis
- Primer designing
- Hemoglobin A2 Estimation
- Hemoglobin Electrophoresis
- Other Biochemical Genetics Tests
- Syndrome/disease/findings identification
- (slide/spot/photograph/specimen/radiologic/gel/electropherogram/etc)
- Syndrome diagnosis using the databases and software
- Pedigree Construction (5 generation)
- Analysis of Sanger sequence chromatograms
- Analysis of MLPA electropherogram
- Analysis of TP-PCR and QF-PCR electropherograms
- Analysis of chromosomal microarray results
- Analysis of NGS data
- In silico analysis of sequence variants and CNVs including use of population databases, mutation databases, & mutation prediction software
- Analysis and interpretation of TMS, urine GCMS and plasma amino acid HPLC results

3. Oral/viva voce examination

Oral examination shall be comprehensive enough to test the post graduate student's overall knowledge on the subject

RECOMMENDED READING

Books (latest edition)

1. Emery and Rimoin's Principles and Practice of Medical Genetics and Genomics. Editors: Reed Pyeritz, Bruce Korf, Wayne Grody. Publisher: Elsevier. 6th Edn. 2013. (ISBN:9780123838353).

2. Practical Genetic Counseling. Editors: Peter Harper, Buterworth Heinmann. Publisher: Edward Arnold Ltd. 3rd Edn. 2013. (ISBN: 9781483183664).
3. Smith's Recognizable Pattern of Human malformations. Editor: Kennethlyon Nenes. Publisher: WB Saunders Company. 7th Edn. 2013. (ISBN: 1455738115).
4. Mendelian Inheritance in Man. Editor: Victor A Mckusick. Publisher: The Johns Hopkins University Press. 2014. (ISBN: 9780801820878).
5. Metabolic and Molecular Basis of Inherited Disease. Editors: Charles R. Scriver, Arthur L. Beaudet, William S. Sly, David Valle, Mc Graw-Hill. Publisher: McGraw-Hill. 8th Edn. 2001. (ISBN10 0079130356).
6. The Principles of Clinical Cytogenetics. Editors: SL Gersen, M B Keagle, Publisher: Humana Press. 3rd Edn. 2013. (ISBN 978-1-4419-1688-4).
7. Textbook of Fetal and Perinatal Pathology, Vol. I & II. Editors: Jonathan S Wigglesworth, Don B Singh. Publisher: Wiley–Blackwell. 2nd Edn. 1998. (ISBN-10:0865421188).
8. Catalog of Teratogenic Agents. Editors: TS Shepard. Publisher: John Hopkins University Press. 13th Edn. 2011. (ISBN-13:978-0801897849).
9. Emery's Elements of Medical Genetics. Editors: Peter Turnpenny, Sian Ellard. Publisher: Elsevier Churchill Livingstone. 15th Edn. 2017. (ISBN: 9780702066856).
10. The Practical Guide to the Genetic Family History. Editors: Bennett Robin. Publisher: Wiley-Liss. 1st Edn. 2010. (ISBN: 0471251542).
11. Chromosomal abnormalities and genetic counseling. Editors: RjJM Gardner, GR Sutherland. Publisher: Oxford university press. 5th Edn. 2018. (ISBN: 9780199329007).
12. Medical Cytogenetics. Editors: Mark Hon Fong L. Publisher: Marcel Dek. CRC Press. 1st Edn. 2000. (ISBN: 0824719999).
13. Congenital malformation evidence-based evaluation and management. Editors: Pravin Kumar, Barbara K Burton. Publisher: McGraw Hill. 1st Edn. 2007 (ISBN:0071471898).
14. Human Molecular Genetics. Editors: Tom Strachan, Andrew Read. Publisher: Garland Science. 5th Edn. 2018. (ISBN 978-0815345893).
15. Genetic disorders and the foetus: diagnosis, prevention and treatment. Editors: Aubrey Milunsky Publisher: Wiley. 7th Edn. 2015. (ISBN: 978-1-1189-8152-8).
16. Management of genetic syndromes. Editors: Cassidy SB, Allanson JE. Publisher: Wiley liss. 4th Edn. 2020. (ISBN: 978-1-119-43267-8).
17. Essentials of Medical Genomics. Editors: Brown Stuart M. Publisher: Wiley-Liss. 1st Edn. 2008. (ISBN: 047121003X)
18. New Clinical Genetics. Editors: Andrew Read and Dian Donnai. Publisher: Scion publishing. 4th Edn. 2020. (ISBN 9781911510703).
19. Human malformations and related anomalies. Editors: Stevenson RE, Hall JG. Publisher: Oxford university press. 3rd Edn. 2015. (ISBN-13: 9780199386031).
20. Radiology of syndromes, metabolic disorders and skeletal dysplasias. Editors: Taybi H, Lachman RS. Publisher: Elsevier. 5th Edn. 2006. (ISBN-13: 978-0815187097).

Journals

10-15 international Journals and 02-05 national (all indexed) journals

Miscellaneous Resources (including web resources)

1. OMIM - Online Mendelian Inheritance in Man, Catalog of all known human genes and genetic phenotypes (The Johns Hopkins University School of Medicine)
2. LMD (London Medical Databases), POSSUM, etc dysmorphology database
3. DECIPHER, ISCA, DGV, UPD, ICCG, etc database
4. GeneClinics: Medical Genetics Knowledge Base, formerly (Genline), diagnosis, management and counseling for individuals and families with inherited conditions
5. GeneTests (formerly Helix) - DNA diagnostic testing and research information
6. ClinGen: The Clinical Genome Resource
7. The Hereditary Cancer Working Group (centralize and curate genetic knowledge in order to develop guidance for molecular diagnostic germline cancer testing)
8. TERIS (teratogen information system), University of Washington
9. Gene/Disease Specific Information (locus specific databases)
10. GeneCards, database of human genes, products and involvement in diseases
11. Merck Manual (professional version): General Genetics, Inheritance of Single-Gene Defects, Multifactorial Inheritance, Nontraditional Inheritance, Chromosomal Disorders, Mitochondrial DNA Abnormalities, Immunogenetics, Forensic Genetics, Genetic Therapy, Congenital Anomalies, Pedigree symbols, Pharmacogenetics, Cancer Genetics, Prenatal Genetic Evaluation and Counseling, etc
12. World Wide Web Biochemical Genetics Test List, University of California, San Diego, Biochemical Genetics
13. EuroGenTest, includes unites on genetic testing: quality management, information databases, public health, new technologies and education, new 5/07
14. Genetics and Cancer (<https://www.cancer.org/cancer/cancer-causes/genetics.html>)
15. Cytogenetic images and animations, Tokyo Medical College, Hironao Numabe, M.D.
16. Before You are Pregnant, March of Dimes (<https://www.marchofdimes.org/pregnancy/getting-ready-for-pregnancy-preconception-health.aspx>)
17. European Teratology Society (ETS)
18. Folic Acid and Prevention of NTD Educational Materials, by CORN education committee
19. Illinois Teratogen Information Service, Chicago

20. Preconception Screening and Counseling Checklist, March of Dimes
21. Policy statements, American College of Medical Genetics
22. Policy statements, American Academy of Pediatrics
23. Policy statements, American Society of Human Genetics
24. Genetic Screening, American Society for Reproductive Medicine
25. Drugs in Pregnancy and Lactation, Perinatology.com
26. Ethics and genetics in medicine. In: Bioethics for clinicians. Burgess MM, et al. CMAJ. 1998. 158:1309-13.
27. AAFP Core Educational Guidelines in Medical Genetics

Post graduate Students Appraisal Form
Pre / Para /Clinical Disciplines

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM.....TO.....

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1.	Journal based / recent advances learning				
2.	Patient based /Laboratory or Skill based learning				
3.	Self-directed learning and teaching				
4.	Departmental and interdepartmental learning activity				
5.	External and Outreach Activities / CMEs				
6.	Thesis / Research work				
7.	Log Book Maintenance				

Publications

Yes/ No

Remarks* _____

***REMARKS:** Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.

SIGNATURE OF ASSESSEE

SIGNATURE OF CONSULTANT

SIGNATURE OF HOD

NATIONAL MEDICAL COMMISSION
Postgraduate Medical Education Board

D 11011/1/21/AC/Guidelines 05

Date: 02-06-2021

**GUIDELINES FOR COMPETENCY BASED
POSTGRADUATE TRAINING PROGRAMME
FOR DM
IN
GERIATRIC MENTAL HEALTH**

DRAFT

GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR DM IN GERIATRIC MENTAL HEALTH

Preamble

The Principles adopted by UN General Assembly resolution 46/119 of 17 December for the protection of persons with mental illness and the improvement of mental health care (MI Principles) recognise the enjoyment of the highest attainable standard of physical and mental health as the right of every human being. This resolution should now be read in the context of the United Nations Convention on the Rights of Persons with Disabilities. In 1996, WHO developed the Mental Health Care Law: Ten Basic Principles as a further interpretation of the MI Principles and as a guide to assist countries in developing appropriate legislation on mental health. The WHO also developed Guidelines for the Promotion of Human Rights of Persons with Mental Disorders.

The principles governing the treatment of persons with mental illness can be summarized as follows:

- The aim of psychiatry is to treat mental illness and promote health to the best of his/her (*psychiatrist's*) ability, consistent with accepted scientific knowledge and ethical principles;
- Every psychiatrist should offer to the patient the best available therapy to the best of his/her knowledge;
- The psychiatrist should inform the patient of the nature of the illness, therapeutic procedures including possible alternatives and of the possible outcome;
- No procedure shall be performed nor treatment given against or independent of a patient's own will, unless because of mental illness, the patient cannot form a judgment as to what is in his/her best interest and without which treatment serious impairment is likely to occur to the health of the patient or others;
- As soon as the conditions for compulsory treatment no longer apply, the psychiatrist should release the patient from the compulsory nature of the treatment and if further therapy is necessary should obtain voluntary consent;

- The value of positive mental health for every human being and the rights of all persons with mental disorders and with disabilities as full citizens of their countries should be recognized;
- All recipients of mental health services, regardless of age, gender, ethnic group or disorder must be treated in the same manner as other citizens in need of health care and their basic human rights and freedoms should be respected.

At the end of the DM training program, the post graduate student should be able to recognize the health needs of the community, should be competent to handle effectively psychiatric problems and should be aware of the recent advances in Psychiatry. He /she should acquire necessary skills in teaching medical / paramedical students. He / she is also expected to know the principles of research methodology.

National Goal: This document aims to provide broad Guidelines to orient postgraduate students of Psychiatry and Geriatric Medicine on the importance of appropriate geriatric mental health care, familiarize them to the mental and other specific problems of the elderly, inculcate in them competencies on mental health care of the elderly and expose them to legal and ethical issues.

Eligibility requirements:

MD (Psychiatry), MD (Geriatrics/Geriatric Medicine)

SUBJECT SPECIFIC OBJECTIVES

Theoretical Knowledge: The primary goal of the program is to train post graduate DM students in the treatment and management of geriatric mental health patients. To achieve this goal, the student should:

1. Discuss and define the importance of the geriatric mental health in the context of the health needs of the community and the national priorities in the health sector.
2. Acquire in-depth understanding of the basic sciences relevant to the practice of Geriatric Mental Health.
3. Identify social, economic, environmental, biological and psychological determinants of health in the geriatric population, and take these into

consideration while planning preventive, therapeutic, rehabilitative, and promotive measures/strategies.

4. Acquire knowledge and skills for educating medical and paramedical professionals in geriatric mental health care.
5. Demonstrate appropriate behavior while dealing with the mental health needs of the geriatric subjects and their families, in alignment with the principles of the National Health Policy.
6. Participate in various components of National Mental Health Program.

Practical and Clinical skills: The DM program in Geriatric Mental Health is devoted principally for clinical training, involving both inpatient and outpatient activities. The postgraduate students should therefore achieve adequate skills, always undertake ethical and evidence-based practice for prevention of mental ill-health, and also for the diagnosis, management and rehabilitation of elderly patients with mental health problems.

Attitudes including communication skills: The post graduate student should acquire adequate communication skills for dealing with mentally ill patients, their relatives and attendants. Regular clinical rounds and academic presentations during the teaching program should help the trainees to develop patient-appropriate attitude, knowledge and communication skills.

Training in Research Methodology: In-house training in research methodology, Ethics and Biostatistics should be encouraged by requiring to attend workshops/courses.

SUBJECT SPECIFIC COMPETENCIES

At the end of the course, the student should be able to acquire the following competencies under the three domains, viz., cognitive, affective and psychomotor:

Cognitive domain (Knowledge domain)

By the end of the course, the post graduate student should develop the following competencies through hands-on learning while working with the geriatric population with mental health problems: To achieve this, the student should:

- Be able to prepare detailed history of the patient with geriatric mental health disorders in order to be able to diagnose correctly the clinical condition, order appropriate investigations and advise the treatment plan.
- Acquire theoretical competencies that would help to provide comprehensive psychiatric medical care which is compassionate, appropriate, and effective for the treatment of mental health problems and for the promotion of improved mental health of older adults suffering from psychiatric and neuropsychiatric disorders.
- Acquire knowledge regarding management of various ethical and legal issues related to mental health of the geriatric patient such as:
 - assessment of decisional capacity,
 - palliative care including legislative guidelines governing prescribing psychotropic substances in nursing home,
 - guardianship,
 - ethical issues including right to refuse treatment,
 - refusal to undergo medical treatments,
 - end-of-life issues.
- Be able to recognise and advise management of medical and psychiatric co-morbid disorders, including their altered presentation in the elderly (eg, agitation, aggressiveness, wandering, changes in sleep patterns, incontinence, aggressiveness) and advise their management.
- Acquire knowledge regarding behavioural treatments using non-pharmacologic approaches, especially in dementia patients, application of behavioural therapeutic strategies, including physical restraints and their limitations.
- Acquire knowledge regarding legislative guidelines governing psychotropic-prescribing in nursing home/s.
- Identify geriatric patients with problems that are likely to be appropriate for various psychotherapies (e.g., interpersonal therapy (IPT), cognitive behavioral therapy (CBT), problem-solving therapy (PST), dynamic therapy, and reminiscence therapy).
- Acquire knowledge on the principles and indications for use of electroconvulsive therapy (ECT) in the elderly.
- Acquire knowledge regarding the interaction of neuro-pharmacological agents used in geriatric patient care with other medications in use and be able to provide appropriate advice.

- Practice evidence-based medicine: make informed decisions about therapeutic interventions that are based on patient evaluation/preferences, scientific data and clinical judgment.
- Describe and discuss the hazards which geriatric mentally ill patient may encounter in hospital and protection in terms of psychological hazard.
- Ensure quality assurance of investigations and therapeutic procedures.
- Discuss the concept of essential drugs and their rational use with particular emphasis on use in geriatric patients with mental health issues.
- Demonstrate the ability to organize psychiatric assistance to public during disasters resulting in mass casualties.
- Demonstrate the ability to organize psychiatric assistance to public during pandemics resulting in mass casualties.
- Describe the physical and chemical restraints used in emergency psychiatric situations (e.g., violence, delirium etc.)
- Develop a psychiatric geriatric unit and drug dependence treatment unit with essential equipment.
- Describe and discuss legal issues in the practice of geriatric Psychiatry.
- Discuss the application of Clinical Psychology as related to geriatric Psychiatry.
- Discuss the modalities for rehabilitation of geriatric psychiatry patients.
- Describe and discuss community geriatric psychiatry
- Describe and discuss geriatric sexuality and sleep disorders.
- Interact with faculty and teams from other disciplines including General Medicine, Family Medicine, Neurology and Physical Medicine and Rehabilitation.

Affective domain (Attitudes including Communication and Professionalism)

The DM candidate at the end of training should demonstrate the ability to:

- Be able to communicate in a professional manner the treatment plan with patients, their family and care givers,
- Be able to function as a part of a team in collaboration with other geriatric mental health care team members including those from related clinical disciplines, psychiatric nursing/occupational therapy staff and nutrition unit.

- adopt ethical principles and maintain proper etiquette in dealing with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.
- develop communication skills to word reports and professional opinion and to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

Leadership skills

- organize team activities in the department and community on geriatric mental health care.
- plan and implement group activities with health staff in the hospital and community.

Professionalism

- Accepts personal responsibility for care of patients with mental health problems, consistent with good work ethics and empathy.
- Demonstrates appropriate truthfulness and honesty with colleagues.
- Recognizes personal beliefs, prejudices, and limitations, which should not come in the way of providing service.
- Respects patient confidentiality at all times in verbal and written communication.

Attitude

- Respects patients' religious, moral, and ethical beliefs and biases, even if they differ from the student's own beliefs.
- Presents all available options accurately and non-directively to the patient and relatives.
- Is aware of the advantages and potential hazards of referring patients and families to community or to national resources.
- Recognizes the limitations of their own skills and seeks consultation when necessary.
- Demonstrates understanding of and sensitivity to end-of-life care and issues regarding provision of care.

Interpersonal and Communication Skills

Human Relationships

- Demonstrates an effective system for identifying and addressing ethical, cultural, and spiritual issues associated with health care delivery to geriatric mental health patients.
- Demonstrates knowledge or applies an understanding of psychological, social, and economic factors which are pertinent to the delivery of health care to geriatric mental health patients.
- Effectively engages the patient and/or family in communications which are non-judgmental and non-coercive.

Psychomotor Domain(subject specific practice based or practical competencies)

a)By the end of the course, the DM student should be able to perform independently, the following procedures:

- Obtain essential and accurate information, through interviews, with geriatric psychiatric patients, family members, caregivers and other health professionals, with attention to:
 - relevant patient history including direct or indirect abuse of the elderly,
 - examination of mental status of patient including structured cognitive assessment,
 - Mental Status Examination including Instrumental Activities of Daily Living (IADL), Activities of Daily Living (ADL), frailty and different frailty index and sarcopenia,
 - assessment of capacity to take decisions regarding treatment, personal careetc,
 - medical evaluation including detailed neurological examination, changes in sleep patternand aggressiveness,
 - Clinical IQ / cognitive assessment,
 - Assessment of extent of family support,
 - availability of efficient and compassionate care giver,
 - community support and safety issues.
- Order appropriate laboratory investigations to help in diagnostic evaluation.
- Diagnose common psychiatric illnesses after clinical examination and on the basis of results of laboratory investigations.
- Develop protocol for a comprehensive treatment plan which would address biological, psychological, and sociocultural domains.
- Prepare a comprehensive case record with all relevant information.

- Obtain proper informed consent.
- Perform on basis of appropriate indications electroconvulsive therapy (ECT) in the elderly.
- Make informed decisions about therapeutic interventions based on patient information and preferences, up-to-date scientific evidence in the field, and clinical judgment.
- Perform neuropsychological assessment in geriatric setting.
- Perform Medical audit, as per established protocol.
- Prepare a detailed discharge summary with all relevant information.

b) The DM student should be able to perform under supervision, the following procedures:

- **Behavior therapy:** behavioral treatments specially in dementia patients, using non-pharmacologic approaches, knowing the limitations of behavioral therapeutic strategies, including physical restraints.
- **Psychotherapy:** identify patients with problems suitable for the various psychotherapies (e.g., interpersonal therapy (IPT), cognitive behavioral therapy (CBT), problem-solving therapy (PST), dynamic therapy, and reminiscence therapy).
- Management of various types of **substance abuse** as well as withdrawal management.
- Management of acute **drug toxicity** like Neuroleptic malignant syndrome (NMS), Acute dystonia etc.
- Genetic Counseling and Family therapy
- The management of patients with suicidal tendencies/ attempt at suicide.

c) The student, at the end of the course should be able to assist in the following:

- Interpersonal therapy
- rTMS (Repetitive transcranial magnetic stimulation) therapy
- TDCS (Transcranial Direct-Current Stimulation) therapy

Syllabus

Course contents:

The student should acquire knowledge in the following areas:

First Year

A: The Basic Sciences as applied to Geriatric Mental Health

I: The Myth, History, Science and Theories of aging:

- The prolongation of youth and life
- Attitudes towards aging
- Definition of aging
- Biological theories of aging:
- Psychological theories of aging
- Social theories of aging
- Length of life: the sex differential
- Stem cells and aging

II: Neuroanatomy, Neurophysiology, Neuropathology and Neuropharmacology of Aging and Behaviour:

- Neuroanatomy:
 - o Brain development
 - o Neuroanatomy and aging brain
 - Brain stem
 - Prosencephalon
 - Cerebral cortex and its connections
 - Association cortex
 - Organisation of sensory-motor systems
 - Limbic system
- Neurophysiology:
 - o Electrophysiological studies in the psychiatric evaluation of the elderly
 - Electroencephalogram(EEG)
 - EEG changes with normal aging, dementia, delirium, depression
 - Magneto Encephalography (MEG)
- Neuropathology:
 - o Normal aging
 - o Alzheimer's disease

- o Dementia with Lewy bodies or vascular dementia
 - o Frontotemporal dementia
- Neuropharmacology of behaviour:
 - o Neural transmission of information
 - o Principles of chemical neurotransmission
 - o Receptors, enzymes and chemical neurotransmission as the target of drug action
 - o Special properties of receptors
 - o Biogenic Amines and behavioral functions:
 - Norepinephrine
 - Dopamine
 - Serotonin
 - Histamine
 - o Acetylcholine and behavioral functions
 - o Non-neuropeptides and behavioral functions
 - Prostaglandins
 - Thromboxanes
 - Purines
 - o Neuropeptides and behavioral functions:
 - Endogenous Opioids
 - Gut peptides
 - Hypothalamic, Pituitary and Pineal peptides

III: Genetics of Geriatric Psychopathology:

- Fundamentals of Genetics:
 - o Molecular Genetics
 - o Linkage analysis
 - o Candidate gene
- Genetic factors in normal and accelerated aging:
 - o Cognitive impairment with advancing aging
 - o Cellular aging research
- Methodology in psychiatric genetics:
 - o Traditional methods
 - o Pedigree and family studies
 - o Twin studies

- o Adaptation studies
- Interpretation of genetic results.
- Genetics of Psychiatric disorders of old age:
 - o Cognitive and motordisorders:
 - Alzheimer 's disease
 - Multi-infarct dementia
 - Parkinson's disease
 - Huntington's disease
 - Pick's disease
 - Transmissible dementias
 - Creutzfeldt-Jacob disease
 - Gerstmann-Straussler-Scheinker Disease
 - o Non-Cognitive disorders:
 - Schizophrenia and related psychosis
 - Mood disorders
 - Schizo-affective disorder
 - Anxiety disorders
 - Adjustment disorders
 - Sleep disorders
 - Sexual disorders
 - Alcohol and substance abuse disorders

IV: Physiological and Medical considerations of Geriatric PatientCare:

- Central Nervous system
 - Cardiovascular system
 - Respiratory system
 - Gastrointestinal system
 - Endocrine system
 - Musculoskeletal system
 - Haematological and immune systems
 - Renal system
 - Considerations in geriatric prescribing
 - Chronic diseases in elderly
 - Geriatric syndromes

- Geriatric assessment

V: Psychological Aspects of Normal Aging:

- Experimental and cognitive psychology
- Neuroimaging and neurosciences
- Behavioural medicine and health and behaviour relationships
- Health and disease interaction with intellectual and cognitive functioning
- Health and self-related health
- Personality and aging in the social context
- Coping in later life
- Care-giving issues in the normal psychology of aging
- Longevity and the extreme aged

VI: Social and economic factors related to Psychiatric Disorders in late life:

- Social risk factors for psychiatric disorders
- Age changes and cohort differences in social risk factors
- Social factors that affect recovery from psychiatric disorders
- Help seeking for psychiatric disorders
- Public policies and programs

VII: Demography and Epidemiology of Psychiatric disorders in late life:

- Demography
- Case identification
- Distribution of psychiatric disorders
- Historical studies
- Etiological studies
- Health service utilization

VIII: Human Development through Life Cycle:

- Infant development
- Childhood development
- Adolescent development
- Adult development
- Normal aging - psychological, socio-cultural, physiological aspects
- Self experience across the second half of the life

IX: Contribution of Intra-psychic and phenomenological theories in Psychopathology of late life:

- Intrapsychic theories
 - Freudian approach
 - Jungian approach
 - Adlerian approach
 - Interpersonal and social approaches
 - Ego theories
- Phenomenological theories
 - Existential movement
 - Humanistic movement
 - Behavioural theories
 - Classical and Operant conditioning theories
 - Drive reduction and reciprocal inhibition theories
 - Social learning and other psychobiological approaches

SECOND YEAR

Principles and Practice of applied sciences (clinical) in Geriatric Mental Health

I: The History and diagnostic interview in late life:

- The Psychiatric interview of older adults:
 - History
 - Physical examination
 - The mental status examination
 - Family assessment
 - Rating scales and standardized interviews
 - Effective communication with the older adults
- Use of the Laboratory in the diagnostic workups:
 - Complete blood count
 - Serological tests for syphilis
 - HIV testing
 - Thyroid Function Test
 - Vit-B12, Folate and homocysteine
 - Toxicology

- Urine analysis
- ECG, EEG, Polysomnography
- Imaging Studies: CT Scan, MRI
- Genetic testing, Apo-E testing
- Ethical and psychological concerns
- Neuropsychological Assessments:
 - Neuropsychological assessment in geriatric settings
 - Neuropsychology of normal aging
 - Differentiation of Alzheimer's Dementia from normal aging
 - Neuropsychological profile of following disorders:
 - Mild cognitive impairment
 - Alzheimer's disease
 - Frontotemporal dementia
 - Lewybody dementia
 - Vascular dementia
 - Parkinson's disease dementia
 - Huntington's disease
 - Progressive Supranuclear Palsy
 - Hydrocephalus
 - Creutzfeldt-Jakob disease
 - Dementia of geriatric depression
 - Stroke
 - Motor neuron disease
 - Demyelinating disorders

II: Clinical Phenomenology and Psychopathology in late Life:

- Disorders in general appearance and behavior
- Disorders of consciousness and orientation
- Disorders of attention and concentration
- Disorders of affect
- Disorders of thinking
- Disorders of perception

- Disorders of memory
- Disorders of intelligence
- Disorders of insight and judgment

III: Socio-cultural foundations of behavior related to late life:

- **Normality and Abnormality:**
 - o Concept of mental health and illness
 - o Attitudes towards mental illness, stigma and social identity
 - o Epidemiological studies and socio-demographic correlates of mental illness in India.
- **Family:**
 - o Personality formation in the family: parent child Dyad
 - o Early development and communication pattern: triadic relationship, familynorm
 - o Self-image and self-esteem
 - o Impact of mental illness on the family: the attribute of responsibility, decision taking, role performance, Power Orientation, care giver burden.
 - o Problems due to family, society, community and generation gap in old age.
- **Disturbance in Interpersonal Processes:**
 - o Personal relationships in different mental disorders of old age.
 - o Abnormal self-attitudes, self -perceptions, self-other perceptions, social competence, interpersonal perceptions.
- **Socio-psychological Methods:**
 - o Clinical applications of social identity, interdependence, social skill and interaction models.
- **Trans-cultural Aspects:**
 - o Socio-cultural studies of socialization: culture and mental illness, social class and mental illness, religion and mental illness, social change.
 - o Ancient Indian concepts of mind: cognition, emotion, motivation, stress, personality and their relevance to modern health.
- **Concepts of mental illnesses and its treatment in ancient Indian thought, and promotive aspects of mental health**

- **Contemporary Indian concepts, theories and models used in geriatric mental health.**

IV: Neuropsychology in late life:

- **Frontal Lobe Syndrome:**
 - o Basic Anatomy
 - o Pre-frontal Cortex
 - o Disturbance of regulatory functions
 - o Disturbance of attentional processes
 - o Disturbances in emotion, memory and intellectual activity
 - o Premotor Cortex: disturbances in psychomotor functions
- **Temporal Lobes Syndrome:**
 - o Basic Anatomy
 - o Special senses, hearing, vestibular functions
 - o Integrative functions
 - o Disturbances in learning and memory functions
 - o Disturbances in speech
 - o Disturbances in emotions, time perception and consciousness
- **Partial and Occipital Lobes Syndrome:**
 - o *Basis Anatomy*
 - o Disturbances in sensory functions and body scheme perception
 - o Agnosias and Apraxias
 - o Disturbances in visual space perception
 - o Disturbances in visual memory
 - o Disturbances in emotions, time perception and consciousness
- **Functional specialization of Cerebral Hemisphere**
 - o Handedness and cerebral dominance
 - o Split brain and reported studies on cerebral lateralization of functions.
 - o Plasticity and restoration of functions.
- **Psychophysiology**
 - o Methodology and measurement.
 - o Psychophysiology of cognition and emotional states
 - o Studies in psychiatric conditions

III: Psychiatric Disorders in Late Life:

- Cognitive disorders

- Movement disorders
- Mood disorders
- Schizophrenia and paranoid disorders and other psychosis
- Anxiety and panic disorders
- Somatoform disorders
- Sexual disorders
- Bereavement and adjustment disorders
- Sleep and circadian rhythm
- Alcohol and drugs associated problems
- Personality disorders
- Agitation and suspiciousness
- Sub-syndromal mental health problems

IV: Treatment of Psychiatric Disorders in late life:

- **Principles and practice of:**
 - o Psychopharmacology
 - o Electroconvulsive therapy
 - o Diet, nutrition and exercise
 - o Individual and group psychotherapy
 - o Working with the family of the older adult
 - o Clinical psychiatry in the nursing homes
 - o The continuum of care: movement toward the community
 - o Acute care inpatient and day hospital treatment

THIRD YEAR

Related allied diagnostic and research sciences in Geriatric Mental Health with recent advances

I: Special Topics:

- Legal, ethical and policy issues
- Integrated community services and rehabilitation
- Housing for elderly
- Yoga/meditation and its applications in mental health.
- The past and future of Geriatric Psychiatry
- Generational conflicts

II: Recent Advances:

- **Basic Sciences:** Neuroanatomy, Neurophysiology, Neuropathology, and Neuro-psychopharmacology
- **Applied Sciences:** Phenomenology, diagnosis, management, rehabilitation
- **Other Special Issues:** Forensic Geriatric Mental Health, Liaison Geriatric Mental Health and Community Geriatric Mental Health.

III: Methods of Clinical Research:

- **Descriptive Statistics**
 - o Univariate: central tendency, skewness and Kurtosis
 - o Bivariate: regression and correlation Coefficient
 - o Special measure of association: Rank Order Correlation Coefficient, Tetrachoric Correlation Coefficient and Phi- Coefficient.
- **Probability**
 - o Probability laws, Binominal, Poisson and normal distributions, sampling from finite population, sample size, sample spare, Student t- statistics, Chi-square statistics, F-Variate, statistical inference.
 - o Estimation, point estimation, interval estimation, test of hypothesis, Type I and Type II errors, tests based on student-t, Chi-Square, V- Variate, proportion tests, tests of goodness of Fit: 2 x 2 contingency table, 2 x r contingency table, r x c contingency table.
- **Analysis of Variance:**
 - o Basic models, assumptions, One way and Two-way classifications, Analysis of covariance Multiple variate analysis: principle component analysis, Factor analysis, Cluster analysis, Discriminate function analysis, Multiple Regression, Data processing and Computer analysis.
- **Non-parametric Statistics:**
 - o Central limit theorem, One sample and Two sample problems, Analysis of variance of rank order statistics.
- **Scientific Method:**
 - o Procedures to ascertain knowledge, scientific method and its features, Courses and effect: Mill's canons.
- **Theory of Measurement:**

- o Measurement Nominal, Ordinal, Interval and Constructing Rating scales and Attitude Scales, Validity Ratio Scales, Reliability scale.
- **Epidemiological Studies:**
 - o Prospective and retrospective studies, prevalence, incidence, age-specific disease and adjusted rates, Life Table technique.
- **Survey Technique:**
 - o Various tools, Mail Questionnaire and interview schedule
 - o Sampling Methods: complete enumeration, sample survey, sampling and non-sampling errors, random and non-random samples
 - o Sample Random, Systematic Random, Stratified Random and Cluster Random Sampling Design; methods of minimizing non-sampling errors.
- **Experimental Design:**
 - o Experiments versus Surveys, general principles in experimental design, requirements for a good design, methods of controlling experimental errors, idea of control, matching, local control, concomitant variation, randomization and replication.
 - o Completely randomized design, randomized block design, Latin Square design, Factorial designs and Cross-Over design.

TEACHING AND LEARNING METHODS

Teaching methodology

1. This should include regular case presentations, didactic lectures, seminars, journal clubs, clinical meetings, and combined conferences with allied departments. The post graduate student should be given the responsibility of managing and caring for patients in a gradual manner under supervision. **Lectures are to be kept to a minimum. They may, however, be employed for teaching certain topics. Lectures may be didactic or integrated. Didactic lectures are of least importance.**
2. Department should encourage e-learning activities.
3. Formal teaching sessions

In addition to bedside teaching rounds, at least 5-hr of formal teaching per week are necessary. The departments may select a mix of activities as given under formative assessment.

The students should also attend:

- accredited scientific meetings (CME, symposia, and conferences).
 - additional sessions on basic sciences, biostatistics, research methodology, teaching methodology, hospital waste management, health economics, medical ethics and legal issues related to medical practice.
4. There should be a training program on Research methodology to build capacity to guide research.
 5. The post graduate student shall be required to participate in the teaching and training program of undergraduate students and interns.
 6. A post graduate student of a postgraduate degree course in broad specialties/super specialties would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
 7. **Log book:** During the training period, the post graduate student should maintain a Log Book indicating the duration of the postings/work done. This should indicate the procedures assisted and performed, and the teaching sessions attended. The Log book shall be checked and assessed periodically by the faculty members imparting the training.

8. Research work

Research Project & publication: Every post graduate student shall carry out research work on assigned research project under the guidance of a Post Graduate teacher, the result of which shall be written up and submitted for publication.

9. Journal Club: 1 hour duration - Paper presentation/discussion - once per week.

10. Seminar: One seminar every week of one hour duration (afternoon)

11. Lecture/discussion: Lectures on newer topics by faculty, in place of seminar as per need.

12. **Case presentation** in the ward and the afternoon special clinic (both long case and short case). Post graduate students will present a clinical case for discussion before a faculty and discussion made pertaining to its management and decision to be recorded in case files.
13. **Case conference:** Post graduate students are expected to work up one long case and three short cases and present the same to a faculty member and discuss the management.
14. **Combined Round/Grand Round:** These exercises are to be done once a week or twice a month involving presentation of unusual or difficult cases. Presentation of cases in clinical combined / grand rounds and clinical series/research data is for the benefit of all clinicians and other related disciplines once in a week or fortnightly.
Emergency situation: Casualty duty to be arranged by rotation among the post graduate students with a faculty cover daily by rotation.
15. Bedside clinical training for patient care management. Daily for ½ to one hour during ward round with faculty and 1-2 hours in the evening by senior resident/faculty on emergency duty, bed side patient care discussions are to be made.
16. **Clinical teaching:** In OPD, ward rounds, apart from scheduled post graduate activities.
17. Post Graduate students shall be required to participate in the teaching and training program of Undergraduate students and interns.
18. A postgraduate student of a postgraduate degree course in broad specialities/super specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
19. **Log books** shall be maintained regularly and should be checked and assessed periodically by the faculty members imparting the training.
20. Department should encourage e-learning activities.

Clinical postings: Recommended schedule for three years training

Three years of posting as per schedule below:

1. Primarily in the Department of Geriatric Mental Health
2. A total of 26 weeks of postings in related/allied subjects, as follows:
 - 8 weeks in the Department of Medicine – during first year of training
 - 3 weeks in the Department of Radiodiagnosis - during first year of training
 - 6 weeks in the Department of Neurology – during second year of training
 - 4 weeks in the Department of Cardiology - during second year of training
 - 5 weeks in the units such as Clinical Epidemiology/Biostatistics and/or Community Medicine - during third year of training

During the training programme, patient safety is of paramount importance; therefore, skills are to be learnt initially on the models / skill labs (affective / psychomotor) later to be performed under supervision followed by performing independently. For this purpose, provision of skills laboratories in medical colleges is mandatory.

ASSESSMENT

FORMATIVE ASSESSMENT during the training includes:

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self-directed learning and ability to practice in the system.

Quarterly assessment during the DM training should be based on:

1. Journal based / recent advances learning
2. Patient based / Laboratory or Skill based learning
3. Self directed learning and teaching
4. Departmental and interdepartmental learning activity
5. External and Outreach Activities / CMEs

The student is to be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I).

SUMMATIVE ASSESSMENT, at the end of training:

The Post Graduate examination for DM shall be in two parts: -

1. **Theory Examination:** There shall be four theory papers as follows:

Paper I: Basic Sciences in Geriatric Mental Health

Paper II: Principles and Practice of applied sciences (clinical) in Geriatric Mental Health

Paper III: Allied diagnostic and research sciences in Geriatric Mental Health

Paper IV: Recent advances in Geriatric Mental Health

2. **Clinical and Practical:** The practical examination should consist of the following:
Clinical examination for the candidates in Geriatric Mental Health shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a specialist/teacher, for which candidates shall examine with a minimum one long case and two short cases.

The Practical examination for DM students in Geriatric Mental Health shall be conducted to test the knowledge and competence of the students for making valid and relevant observation based on the experimental/laboratory studies and his/her ability to perform such studies as are relevant to his/her subject.

The clinical examination consists of the following activities

- a) One long case (Geriatric Mental Health)
- b) Two short cases (one Psychiatry & one Neurology)
- c) Spots consisting of EEG, Neuro-imaging and psychological testing instruments
- d) Oral examination

3. **Viva-voce Examination**

The oral examination shall be through and shall aim at assessing the student's knowledge and competence about the subject, investigative procedures, therapeutic techniques and other aspects of the Geriatric Mental Health which form a part of examination.

Recommended Books and Journals

Text books (recent edition)

Psychiatry

1. Allan I.F Scott (eds). The ECT Hand book, The Royal College of Psychiatrists
2. Gabbard, G, Beck, JS and Holmes J. Oxford textbook of Psychotherapy, Oxford, Oxford University Press.
3. Gelder M, Andreasen N, Lopez-Ibor J, and Geddes J. (eds). The new Oxford text book of Psychiatry, Oxford University Press, Oxford.
4. Johnstone EC, Freeman C, Zealley A (eds). Companion to Psychiatric studies, Edinburgh; Churchill Livingstone.
5. Lishman, W.A. Organic Psychiatry; The psychological consequences of cerebral disorder, Blackwell, Oxford.
6. Levenson, J.L. The American Psychiatric Publishing Text book of Psychosomatic medicine, American Psychiatric publishing Inc. Washington DC.
7. Lowinson JH, Ruiz p, Hillman RB, Langrod JG (eds). Substance abuse; A Comprehensive text book, Baltimore MD, Williams & Wilkins.
8. Michels R et al (eds). Psychiatry, JB Lippencott Philadelphia, 1982.
9. Ministry of Health and Family Welfare. National Mental Health Programme Booklet DGHS. New Delhi, 1982
10. Hales RE, Yudofsky SC, Talbott, JA (eds). Text book of Psychiatry, JPB Publishers New Delhi.
11. Slater E, Roth M, Mayer-Gross, Slater and Roth's Clinical Psychiatry, Bailliere - Tindall, London, UK.
12. Stoudemire A, Fogel BS (eds). Psychiatric care of the medical patient Oxford University press, New York.
13. Taylor, D, Paton C, Kerwin D. The Maudsley Prescribing Guidelines. Taylor and Francis, London.
14. Thornicroft, GandSzmukler, G. Text book of Community Psychiatry, Oxford University Press, Oxford.
15. Tasman, Kay and Lieberman (eds). Psychiatry, Wiley.
16. Vyas JN, Ahuja N. (eds). Text book of Postgraduate Psychiatry, JPB Publishes New Delhi.
17. World Health Organization. The ICD 10 classification of mental and behavioral disorders, clinical descriptions and diagnostic guidelines, World Health Organization, Geneva.
18. Yudofsky SC, Hales RD (eds). Text book of Neuropsychiatry, Washington DC, American Psychiatric Press.

Neurology

1. Ropper AH and Brown RH. Adams and Victor's Principles of Neurology, McGraw – Hill.
2. Bradley, Walter G, Neurology in Clinical Practice, Elsevier.
3. John Philp Patten. Neurological differential diagnosis Springer – Verlag London Ltd.
4. Spillane J. Bickerstaff's Neurological examination in clinical practice Blackwell Science.
5. Mazzoni P, Lewis P. Rowland. Merritt's neurology Handbook. Lippencott.
6. Wadia NH. Neurological practice: An Indian Perspective, Elsevier.
7. Pincus J, Tucker GJ. Behavioural Neurology. Oxford University Press, Newyark.
8. William W Campbell. Dejong's The Neurologic Examination. Lippincott Williams & Wilkins.

Psychology

1. Clifford T. Morgan, Introduction to Psychology, McGraw Hill.
2. Smith EE, Susan Nolen – Hveksenma, Fredrickson B, Akinson G & Hilgard introduction to Psychology. Wadsworth publishing.
3. Irwin G. Savason Abnormal Psychology; The problem of Mal-adaptive behavior. Prentice Hall.
4. John W. McDavid & Herbert Haravi. Social psychology individual, groups, societies Harper & Row Publishers, Inc, US 183.
5. Robert S, Feldman. Understanding psychology. McGraw Hill.
6. Baron RA. Psychology, Allyn & Bacon.
7. American Text book of geriatric psychiatry.

Journals

03-05 international Journals and 02 national (all indexed) journals

Postgraduate Students Appraisal Form
Pre / Para /Clinical Disciplines

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM.....TO.....

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1.	Journal based / recent advances learning				
2.	Patient based /Laboratory or Skill based learning				
3.	Self directed learning and teaching				
4.	Departmental and interdepartmental learning activity				
5.	External and Outreach Activities / CMEs				
6.	Thesis / Research work				
7.	Log Book Maintenance				

Publications

Yes/ No

Remarks* _____

***REMARKS:** Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.

SIGNATURE OF ASSESSEE

SIGNATURE OF CONSULTANT

SIGNATURE OF HOD

**NATIONAL MEDICAL COMMISSION
Postgraduate Medical Education Board**

D 11011/1/21/AC/Guidelines 06

Date: 02-06-2021

**GUIDELINES FOR COMPETENCY BASED
POSTGRADUATE TRAINING
PROGRAMME FOR DM IN PEDIATRIC
NEPHROLOGY**

DRAFT

GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR DM IN PEDIATRIC NEPHROLOGY

1. PREAMBLE:

While there has been improvement in nutritional status and immunization coverage over the last three decades, chronic non-communicable diseases involving various systems are now becoming an important cause of mortality and morbidity in childhood. There is an increasing demand for specialized care of children with chronic diseases. Children with kidney diseases are often diagnosed and referred in late stages of the disease. Most of them are not treated appropriately due to lack of expertise and want of diagnostic and therapeutic infrastructure. A phenomenal progress has taken place that has revolutionized management of children with renal diseases. However, children with renal diseases in our country have been largely denied the benefits of advanced medical management. For pediatricians to provide optimal treatment for these children, special training and in-depth knowledge are necessary. It is imperative to provide suitable facilities for appropriate and relevant training in pediatric nephrology to promote growth of the specialty in the country. The training should emphasise on preventive aspects, early diagnosis of common diseases and their optimum management with available resources including dialysis and transplantation. The primary goal of the training programme for DM in Pediatric Nephrology is to develop clinicians who have acquired the operational skills, professionalism and knowledge necessary to direct a pediatric nephrology service, including dialysis and kidney transplantation.

The program includes 36 months of training and is designed to provide the experiences necessary for the DM students to develop the knowledge and skills to function as an independent pediatric nephrologist and fulfill the requirements as mandated by the Medical Council of India.

Eligibility for admission: M.D in Pediatrics

Goals:

The goal of the course shall be to produce a competent specialist in the area of Pediatric Nephrology:

1. who shall be competent to handle the health needs of patients in the speciality and provide secondary and tertiary level of care,
2. who shall be able to practice the speciality ethically,
3. who shall be aware of the contemporary advances and developments in the subject,
4. who shall acquire a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology, and
5. who shall have acquired the skills for teaching medical and paramedical professionals.

A. Objectives:

The objectives of the training programme will be to enable the student:

1. To develop a scientific approach, based on the understanding of the pathophysiology and epidemiology of pediatric renal disease,
2. To provide primary, secondary and tertiary care to children with renal disease,
3. To provide the skills for management of emergencies in unstable children with renal problems and provide renal care to critically ill children in the intensive care unit,
4. To implement a follow up plan in children with chronic disease,
5. To be able to work in a team along with intensivists, pediatricians, pediatric surgeons and others to provide comprehensive care to children with renal disease,
6. To be able to set up and manage an independent Pediatric Nephrology unit including dialysis,
7. To develop adequate communication and counselling skills,
8. To recognize the importance of family, society and socio-cultural environment in the treatment of the sick child with renal disease,
9. To review and analyse literature, seek evidence and apply to clinical practice,
10. To develop basic research skills and carry out research projects in the field of Pediatric Nephrology, and
11. To develop basic teaching skills and be able to train undergraduates, postgraduates, nursing and paramedical staff regarding care of children with renal disease.

2. *SUBJECT SPECIFIC LEARNING OBJECTIVES*

- **Cognitive Domain: Theoretical Knowledge**

- 1) Understand the normal renal anatomy and physiology from fetal life to adolescence.
- 2) Understand the normal physiology and pathophysiology of body fluids, acid-base and electrolytes including neonates and infants.
- 3) Understand the basic principles involved in pathology of renal diseases in children and their assessment as applicable to pediatric nephrology practice.
- 4) Understand the basics of pathologic interpretation of the biopsy, including all the components: light, immunofluorescence, electron microscopy and immuno-histochemical staining.
- 5) Be conversant with the etiology, pathophysiology, diagnosis and management of common neonatal and pediatric renal diseases in an out -patient, inpatient and emergency settings.
- 6) Demonstrate knowledge about biomedical, clinical and cognate sciences and how to apply them in the management of children with kidney diseases.
- 7) Know and apply the basic and clinically supportive sciences and present evidence-based recommendations for diagnostic and therapeutic decision making in children with renal diseases.
- 8) Recognize the importance of inter-disciplinary approach in the management of various pediatric renal diseases and obtain relevant specialist / ancillary services' consultation where appropriate.
- 9) Acquire knowledge for the prevention of renal diseases in children.

- **Practical and Clinical skills**

- 1) Understand the presentation (history and clinical examination), evaluation and management of congenital and acquired renal disorders in neonates, infants and children.
- 2) Order relevant investigations and competently interpret the results of laboratory studies including urinalysis and the results of general and renal imaging procedures performed in children with kidney and urinary tract disorders.
- 3) Formulate and implement treatment plans, and monitor the effectiveness of their interventions for various renal diseases including management of acute

kidney injury, chronic kidney disease and end-stage renal disease in a holistic manner.

- 4) Perform competently all medical and invasive procedures, i.e., (a) percutaneous renal biopsy of native and transplanted kidneys, (b) placement of temporary vascular access or peritoneal catheter for renal replacement therapy (RRT), (c) Perform hemodialysis, acute and chronic peritoneal dialysis and continuous renal replacement therapy, and (d) Urine analysis.
- 5) Develop desired skills to independently manage emergency situations related to renal disease.
- 6) Communicate effectively and demonstrate caring and respectful behavior when interacting with children with renal and urinary tract problems and their families.
- 7) Be conversant with counseling techniques for the family / primary care takers.
- 8) Work with faculty and colleagues to provide patient-focused care.
- 9) Perform necessary patient care documentation in an accurate and timely manner.
- 10) Develop skills as a self-directed learner, recognize continuing educational needs and use appropriate learning resources to critically analyze relevant published literature in order to practice evidence-based medicine.

- **Writing Research articles**

- 1) Demonstrate competence in basic concepts of research methodology and epidemiology and be able to critically analyse relevant published research literature,
- 2) Locate, appraise and assimilate evidence from scientific studies,
- 3) Develop the expertise to perform a scientific study including formulating hypothesis, research questions, designing appropriate study, analyze and interpret the results,
- 4) Ability to write an in-depth manuscript describing a completed project,
- 5) Publication or presentation of case reports or clinical series at local, regional, or national professional and scientific society meetings.

- **Attitudes including communication skills**

- 1) Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society; and a commitment to excellence.

- 2) Demonstration of skill in listening to patients and families and the ability to effectively educate and counsel patients and their families on diagnostic and treatment decisions including initiation of dialysis therapies and prognosis.
 - 3) Develop the skills to interact with professional colleagues for the care of the renal patient.
 - 4) Demonstrate the ability to lead the consult service through interactions with referring and primary doctor.
 - 5) Effectively work with other members of the health care team, including referring physicians from other specialties, nurses, social workers and technicians, to implement a treatment plan.
 - 6) Effectively teach pediatric nephrology care to medical students, junior post graduate students and nurses.
 - 7) Adopt ethical principles in all aspects of pediatric nephrology practice/ research. (Professional honesty and integrity, humility, informed consent, counseling and recognize patients' rights and privileges).
- **Training in Research Methodology**
 - 1) Attend research methodology course to learn framing of research question, designing and conducting study, analysing and interpreting data and writing a paper.
 - 2) Participate in on-going research activities of the department to obtain experience in various aspects of research.
 - 3) Apply knowledge of study designs and statistical methods to the appraisal of clinical studies and other information on diagnostic and therapeutic effectiveness.
 - 4) Familiarize with ethics in research.

3. SYLLABUS

3.1 SUBJECT SPECIFIC THEORETICAL COMPETENCIES

3.1.1 Cognitive domain (Knowledge domain)

3.1.2 Affective domain (Attitudes including Communication and Professionalism)

3.2 SUBJECT SPECIFIC PRACTICE BASED OR PRACTICAL COMPETENCIES

The curriculum outlines competences that trainees must reach by the end of the programme (combining 3.1 and 3.2)

A. Investigation of the kidney

1. Renal Anatomy and Physiology

Knowledge	- To understand the embryology and development of genito-urinary system - To understand the development of renal function and physiology for the assessment of: a. GFR from height and plasma creatinine b. Calcium, phosphate & bone mineral metabolism c. Urinary concentrating and diluting ability d. Tubular handling of fluid and electrolytes e. Acid-base balance - To explain the practicalities, limitations and special precautions of measurement of: a. Creatinine clearance b. Protein and calcium excretion c. Tubular handling d. Tests for urinary acidification
Skills	To appropriately request and interpret the above investigations
Multidisciplinary aspects	Laboratory Medicine Department
Resources	Clinical Physiology of Acid-Base and Electrolyte Disorders – Burton David Rose Principles of Renal Physiology – Chris Lote Pediatric Renal Investigations – Chapman & Taylor

2. Imaging

Knowledge	- To understand the role, limitations and interpretation of commonly used imaging modalities - To know the practicalities and safety precautions associated with each test - To understand the role of arteriography and percutaneous
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	nephrostomy tube placement
Skills	- To appropriately request the different radiological investigations - To be able to interpret scan images
Multidisciplinary aspects	Liaison with radiologists in deciding the most appropriate investigations
Resources	- Nephro-urology radiology meetings/Posting in nuclear medicine unit - Bank of typical case images

3. Renal Biopsy and nephropathology

Knowledge	- To describe the anatomy of both native and transplant kidneys - To know the indications for renal biopsy - To describe the procedure of renal biopsy and its complications - To know the type of solutions used for light (LM), immunofluorescence (IF), and electron microscopy (EM) specimens immediately post-biopsy - To have a basic knowledge of handling and processing of renal biopsy tissue and utility of various stains (hematoxylin and eosin, periodic acid Schiff, Trichrome (Masson), silver-stains, and Congo red /immuno-fluorescence used in the diagnosis of renal disease.
Skills	- To counsel families in preparation for renal biopsy, thus allowing informed consent - To perform a native (and transplant) biopsy safely - To recognize the histopathologic characteristics of normal kidney on LM, IF, and EM - To recognize common histological appearances and consequences for diagnosis, prognosis and treatment - Able to interpret slides, including all the components: LM, IF and EM. - Obtain adequate clinical background and information from the

	appropriate nephrologist submitting the specimen to allow optimal interpretation of the biopsy.
Multidisciplinary aspects	Radiologist and pathologist
Resources	Nephropathology meetings Bank of typical case histology Training day for processing, staining and interpreting of renal biopsy samples

(B) Urinary Tract Infection (UTI) and Vesicoureteric Reflux

Knowledge	• To know the epidemiology of UTI • To understand current theories about renal scarring • To be aware of issues in diagnosis of UTI • To describe the role of ultrasound scan, MCU, DMSA and other investigations for UTI • To know the medical and surgical options in the management of UTI • To describe the mechanisms of action of antimicrobials and their adverse effects • To understand the secondary progression of renal damage and its prevention
Skills	• To appropriately manage urinary tract infection in different age groups • To show ability to counsel parents about relevant investigations of UTI, and possible management of siblings of children with reflux
Multidisciplinary aspects	• To know the appropriate follow-up into adult life • To recognize the role of microbiologists, urologists and radiologists • To be able to contribute to the development of strategies for management of UTI at local and regional level
Resources	• Microbiology department • Nephro-pediatric surgery-radiology meeting

(C) Structural Malformations

Knowledge	• To understand renal embryology and developmental anatomy • To describe the anatomy of the urinary tract and the sites and causes of urinary obstruction • To know the presentations of developmental variants and abnormalities, including obstruction • To describe the fluid and electrolyte disturbances occurring following the relief of obstruction • To be aware of the different reconstructive procedures performed, and their implications for future management • To be aware of other urological diagnoses, including genital anomalies • To know the importance of ambiguous genitalia and intersex in renal disease: structural as well as neoplastic
Skills	• To be able to provide medical support to urological services, especially following relief of obstruction
Multidisciplinary aspects	• Liaison with radiologists, obstetricians and surgeons in management decisions and antenatal counseling • To show ability to communicate and work together with other health professionals
Resources	• Department of Pediatric Surgery • Radiology meeting • Department/Division of Neonatology

(D) Disorders of Micturition

Knowledge	• To know the common renal and non-renal diagnoses associated with enuresis • To know the appropriate use of urodynamic studies • To explain the rationale for various management strategies in enuresis using behavioral and pharmacological therapies
Skills	• To be able to interpret urodynamic studies, and instigate appropriate management • To know the practicalities involved in enuretic alarms

Multidisciplinary aspects	• Liaison with urodynamic staff • Role of the psychologist
Resources	Pediatric urologists/surgeons Bank of images

(E) Neurogenic bladder

Knowledge	• To know the pathophysiology of neurogenic bladder • To know the role of basic urodynamic investigations • To know the appropriate surgical management of different types of bladder dysfunction • To understand the treatments available to regularize bowel and bladder habit
Skills	• To be able to appropriately assess the whole child with neurogenic bladder • To show ability to investigate and manage the upper and lower urinary tract
Multidisciplinary aspects	• To know the importance of shared care with surgeons and urologists
Resources	• Pediatric urology services

(F) Hematuria

Knowledge	• To know the pathophysiology of macroscopic and microscopic hematuria • To describe the methods of investigation in microscopic hematuria, including the role of renal biopsy • To understand the various findings of phase contrast microscopy and their meaning • To know the underlying causes of hematuria • To know the long term outcome of the underlying causes
Skills	• To be able to perform urinalysis • To demonstrate appropriate investigation and management of the child with hematuria, including role of imaging,

	urological assessment, and genetic and molecular studies
Multidisciplinary aspects	• To explain the mode of inheritance of hereditary nephritis, and implications for other family members • To appreciate the role of the pediatric surgeon • To understand the need for long-term follow up
Resources	• Nephropathology meeting • Pathology laboratory (microscopy of urine)

(G) Proteinuria

Knowledge	• To know the pathophysiology of proteinuria • To know the physiological and pathological causes of asymptomatic proteinuria • To describe the methods of investigation of asymptomatic proteinuria • To list the indications for renal biopsy • To know the long-term prognosis of the various conditions causing proteinuria
Skills	• To be able to differentiate between pathological and physiological proteinuria • To show ability to manage the child with proteinuria
Multidisciplinary aspects	• To understand the requirement of long-term follow-up

(H) Glomerular disease

Knowledge	• To describe the etiology, pathophysiology and immunological basis of glomerulonephritis • To know the different forms of presentation • To understand the clinical course and prognosis of acute and chronic glomerulonephritis • To know the indications for immunosuppressive agents, cytotoxic drugs, plasmapheresis and dialysis
Skills	• To appropriately investigate and manage the acute nephritic syndrome, and new presentation of chronic

	glomerulonephritis To demonstrate the appropriate use of general and specific measures to treat glomerulonephritis
Resources	Pathology laboratory

(I) Nephrotic syndrome

Knowledge	- To know the causes of nephrotic syndrome - To be aware of the pathophysiology of nephrotic syndrome, including latest research - To understand the investigation of nephrotic syndrome including indications for renal biopsy - To understand the complications of the nephrotic state - To know the pharmacology and side-effects of steroids, other immunosuppressive agents and other treatment modalities
Skills	- To appropriately investigate and manage initial episode of nephrotic syndrome and relapses and the complications - To appropriately investigate and manage steroid resistant nephrotic syndrome and the complications - To manage adverse effects of immunosuppressive medications - To demonstrate the appropriate use of general and specific measures to treat secondary causes of nephrotic syndrome
Multidisciplinary aspects	Liaison with local pediatricians in long-term management
Resources	Pediatrics, Pathology

(J) Systemic lupus erythematosus (SLE)

Knowledge	- To describe the pathogenesis of SLE and underlying immunological mechanisms - To list the histological classification of lupus nephritis - To describe the clinical course of lupus nephritis - To describe the different treatment options
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Skills	• To perform a relevant clinical examination to diagnose and assess a patient with SLE • To plan and interpret investigations, including renal histology and immunology • To appropriately manage acute renal failure due to SLE, including use of plasmapheresis • To show ability to undertake long-term management of the patient with lupus nephritis
Multidisciplinary aspects	• To appreciate the role of other specialists, especially rheumatologists • To counsel the patient about long-term implications of SLE, including problems with renal transplantation and impact on reproductive potential
Resources	Adult nephrology, rheumatology services

(K) Other Vasculitis

Knowledge	• To understand the pathophysiology and immunology of vasculitis • To know the different causes of vasculitis • To know the presentation of vasculitis, patterns of multisystem involvement and spectrum of disease • To describe the investigation and monitoring of the patient with vasculitis • To list the different therapeutic options available, including adverse effects
Skills	• To perform a relevant multisystem clinical examination • To be able to appropriately investigate and treat vasculitis, including use of immunosuppression, in the short and long-term
Multidisciplinary aspects	To work with other specialists including rheumatologists
Resources	Pediatric and adult rheumatology clinics

(L) Hemolytic uremic syndrome (HUS)

Knowledge	• To understand the pathophysiology of microangiopathic hemolytic anemia • To know the epidemiology of VTEC, <i>S. dysenteriae</i> • To know the presentation and clinical course of diarrhea-positive and atypical HUS • To be aware of non-renal manifestations of HUS • To understand the long-term consequences and prognosis of D+ HUS • To understand principles of treatment, including conservative, and the role of plasma exchange and dialysis • To understand the investigation of atypical HUS • To be aware of the long-term management of atypical HUS including implications for transplantation
Skills	• To be able to investigate, diagnose and manage the initial presentation of HUS • To appropriately initiate dialysis and plasma exchange

(M) Interstitial nephritis

Knowledge	To list the causes of interstitial nephritis and tubulointerstitial disease, and the relationship to systemic conditions
Skills	To appropriately investigate and manage the child with interstitial nephritis, including use of corticosteroids

(N) Hypertension

Knowledge	• To define and understand how to diagnose hypertension • To know the common renal and non-renal diagnoses implicated in hypertension in different age groups • To describe the possible mechanisms causing primary (essential) and secondary hypertension • To describe the investigation of hypertension including the use of arteriography and renal vein sampling ; nuclear imaging • To describe the mechanism of action and side-effects of
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	anti-hypertensive agents • To understand vascular interventions in renal artery stenosis
Skills	• To show ability to appropriately investigate the child with hypertension • To be competent in the management of hypertensive emergencies • To be competent in the management of chronic hypertension, and in using the different classes of drugs • To be able perform and interpret ABPM read out and modify prescription
Multidisciplinary aspects	• Liaison with local pediatricians; interventional radiologist
Resources	• Intensive care unit; Radiology services

(O) Nephrolithiasis

Knowledge	• To know the etiology of renal stone formation, including underlying tubular abnormalities • To know the biochemical and radiological investigation of renal stones • To understand the acute and chronic medical (including prevention of the development of renal stones) and surgical management of renal stones (including lithotripsy)
Skills	• To demonstrate ability to appropriately investigate the child with renal stones • To show ability to manage the child with renal stones
Multidisciplinary aspects	• To involve pediatric urologists where indicated • To show understanding of the significance of the family history and genetic implications in some cases
Resources	Departments of Laboratory Medicine, Pediatric Surgery, Urology and Radiology

(P) Tubular disorders

Knowledge	• To understand the different presentations of primary and secondary tubular disorders • To know the different causes • To understand the investigation of tubulopathies
Skills	• To be competent in the investigation and management of tubular disorders
Multidisciplinary aspects	• To understand the role of other specialists (hepatologists, neurologists, biochemists, geneticists) in the diagnosis, management and treatment of these disorders • To be able to provide dialysis support to other specialists
Resources	Metabolic clinics, Endocrine clinic Biochemistry department

(Q) Cystic disease

Knowledge	• To list the different causes of renal cystic disease in different age groups • To describe the mode of inheritance and methods of screening • To know the clinical course and associated features of autosomal recessive and autosomal dominant polycystic kidney disease
Skills	• To appropriately examine and investigate the child with renal cysts in different age groups • To appropriately manage the child with polycystic kidney disease
Multidisciplinary aspects	• To appreciate the implications of a diagnosis of autosomal dominant polycystic kidney disease on other family members • To recognize the importance of genetic counseling
Resources	• Radiology services

(R) Genetic disorders (Inherited diseases of the kidneys)

Knowledge	- To know the presentation and management of commonly encountered inherited renal disease including renal involvement in syndromes, familial nephritis and polycystic kidney disease - To understand basic genetic principles
Skills	To be able to advise parents of the risks of recurrences and the need for family screening in commonly inherited diseases
Multidisciplinary aspects	To understand the role of the geneticist in diagnosis and counseling, including antenatal diagnosis
Resources	Geneticist

(S) Fluid and electrolyte disturbances

Knowledge	- To understand the physiology underlying fluid and electrolyte imbalance in the child without primary renal disease - To know the principles of treatment of fluid and electrolyte imbalance - To know the endocrine diseases associated with electrolyte imbalance and their management
Skills	To be able to manage fluid and electrolyte imbalances in non-renal disease including overdose
Resources	- Intensive care unit - Endocrine clinics

(T) Acute Kidney Injury (AKI)

Knowledge	- To know the differential diagnosis of AKI - To know the investigation including role of renal biopsy - To describe the methods to correct fluid and biochemical abnormalities and to know the indications for dialysis - To describe the principles of dialysis and filtration - To know the treatment of reversible causes of AKI
Skills	To perform a reliable and accurate clinical assessment of

	the patient's fluid status • To be able to appropriately manage the complications of AKI – conservative and dialysis • To be able to select and practically manage the different dialysis modalities including peritoneal dialysis, hemodialysis and hemofiltration • To be able to commence correct treatment of the underlying cause • To manage the patient with multiorgan failure or systemic disease requiring acute renal replacement therapy
Multidisciplinary aspects	• To recognize the role of nurses in the management of AKI • Liaison and share care with the intensive care unit
Resources	Intensive care and neonatal intensive care units

(U) Chronic Kidney Disease (CKD)

Knowledge	• To know the epidemiology of CKD • To list the causes of CKD • To know the investigations required in a child with new presentation of CKD, including assessment of the degree of renal failure and reversibility of the condition • To understand the natural history and prognosis of common diseases causing CKD, and treatment strategies that may ameliorate the condition • To understand the factors involved in failure to thrive in CKD • To describe the pathophysiology, investigation and indications for treatment in the management of renal bone disease • To describe the pathophysiology of renal anemia, and its investigation and management, including use of erythropoietin and iron therapy
Skills	• To identify and appropriately manage the underlying cause

	• To manage the child with CKD including biochemical disturbance, bone disease and anemia • To appropriately counsel the family to facilitate the selection of dialysis modality and prior to referral for renal transplantation • To make an accurate clinical assessment of nutritional status and to use appropriate dietary advice with the assistance of dietitians • To prescribe and monitor treatment for hyperlipidemia • To show ability to prevent, diagnose and manage renal bone disease • To diagnose and appropriately treat renal anemia
Multidisciplinary aspects	• To appreciate the role of the multiprofessional team including dietitian, psychologist, social worker • To understand the role of the dialysis nurses and transplant coordinator • To audit biochemical and hematological results against national guidelines • To appreciate the impact of CKD on cardiovascular disease in adult life
Resources	• Chronic kidney disease clinics • Multidisciplinary team meeting

(V) Transplantation

Knowledge	Pre-Transplantation • To understand the ethical issues surrounding organ donation/ transplant • To know the principles of recipient selection, indications and contraindications • To describe the theoretical and practical application of blood grouping, HLA matching and donor-recipient cross
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	matching • To know what is involved in a transplant work-up • To know the advantages and disadvantages of deceased versus live related donor transplantation • To know the acceptability criteria for deceased organ donation • To describe the advantages and disadvantages of preemptive transplantation Transplantation • To understand the unique needs of children undergoing organ transplantation • To know the basic surgical procedures involved • To know the medications used, including side-effects and recent advances and trials • To know the approach towards handling deceased organ transplantation Post-Transplantation • To know the indications for and knowledge of the procedure of renal transplant biopsy • To understand the immune mechanisms of rejection • To know the recurrence rate of the original disease, and other complications pertaining to the original diagnosis and their management
Skills	Pre-transplantation • To assess the suitability of a patient for renal transplant • To discuss the issues of transplantation Transplantation • To be able to manage the peri-operative transplant period • To assess renal transplant function • To plan and modify immunosuppressive therapy Post-transplantation

	• To be competent in the diagnosis and management of acute rejection episodes • To understand the role of fine needle cytology and histopathology for diagnosing rejection • To be able to manage the stable transplant patient • To be able to advise the child, family and school • To be able to diagnose and manage chronic rejection • To be aware of the diagnosis and management of the short and long-term complications of transplantation • To counsel patients with a failing graft and discuss future management on renal replacement therapy
Multidisciplinary aspects	To understand the role of the transplant coordinator To appreciate the role of the multidisciplinary team
Resources	• Transplant clinics • Tissue typing laboratory • Transplant surgeon

(W) DIALYSIS

1. Hemodialysis

Knowledge	• To describe the principles of hemodialysis and compare and contrast with other methods of dialysis • To describe the anatomy of the neck veins, and their assessment • To describe the methods of vascular access and arterio venous fistulas, and their complications • To understand the principles of water treatment and maintaining water quality • To define the methods to assess adequacy of hemodialysis • To list the complications occurring during dialysis • To list the particular infections which may occur in patients on dialysis, and to define strategies to prevent blood-borne viral infections in patients on hemodialysis
Skills	• To be able to plan the initiation of hemodialysis

	• To manage different forms of vascular access, and their difficulties • To assess the functional status of AV fistula and cannulate • To operate hemodialysis machine and respond to alarms; disinfection of machines and circuits • To be able to handle dialyzers and the dialyzer tubings appropriately • To adjust the prescription of hemodialysis based on adequacy and monitor change • To manage the complications of hemodialysis • To diagnose, investigate and treat infection
Multidisciplinary aspects	• To understand the role of the nurses in preparing the patient physically and psychologically for hemodialysis, and in the long term management • To counsel patients about blood borne infection • To work closely with the microbiologist in developing protocols and in audit and management of infection
Resources	Hemodialysis technician and nurses Departments of Nephrology, Microbiology and Surgery

2. Peritoneal Dialysis

Knowledge	• To describe the principles of acute and peritoneal dialysis, and know the advantages and disadvantages compared to hemodialysis • To describe methods to assess adequacy of peritoneal dialysis and ultrafiltration • To describe the anatomy and outline the surgical procedure of insertion of peritoneal dialysis catheters • To know the complications of peritoneal dialysis, both infective and mechanical
Skills	• To be able to prescribe peritoneal dialysis and monitor change and measure adequacy • To perform peritoneal equilibration test (PET)

	• To operate and troubleshoot PD cyclers • To manage the complications of peritoneal dialysis
Multidisciplinary aspects	Pediatric surgeon

(X) Pharmacology

Knowledge	• To define the principles of pharmacokinetics and drug handling in renal impairment • To list ways in which different classes of drugs act on the nephron • To describe how drugs may affect renal function • To list the effects of hemodialysis, hemofiltration and peritoneal dialysis on drug prescribing • To describe the principles of drug interactions especially immunosuppressive agents
Skills	• To prescribe safely to patients with renal disease
Multidisciplinary aspects	• To educate patients regarding importance of compliance and reporting of problems with medication
Resources	Pharmacologists

(Y) Psychosocial and Ethical issues

Knowledge	• To understand the impact of chronic illness on the child, adolescent, parents, siblings and extended family • To understand the ethics of research in children • To know the process of informed consent in different ages • To know the procedures for clinical trials
Skills	• To demonstrate competence in communication skills at initial diagnosis and thereafter • Liaison with pediatricians and other health professionals • To show interest in ethical discussions within the department • To show ability to take informed consent
Multidisciplinary aspects	• To understand the role of the psychologist, psychiatrist,

	social worker, teacher and religious leaders • To understand the care of the dying child
Resources	Multidisciplinary team meeting

(Z) Teaching skills

Knowledge	• To understand the principles of adult learning and different teaching techniques • To understand the role of clinical audit and research
Skills	• To demonstrate formal and informal teaching skills at undergraduate and postgraduate level, and to other professionals within the multidisciplinary team • To demonstrate continuing self-education and self-reflection • To show support or active involvement in research • To show ability to critically evaluate literature reviews, audit and research papers • To demonstrate ability in oral presentation skills and manuscript preparation

(A1) Nutrition

Knowledge	• To develop basic knowledge of nutritional requirements of children with acute kidney injury and chronic kidney disease including those on dialysis and transplantation
Skills	• To be able to counsel and provide nutritional advice for children with chronic kidney disease
Multidisciplinary aspects	• Nutritionist

Competency in Procedural /Practical Skills:

The post graduate student should be able to perform independently the following procedures

- **Renal biopsy**

Satisfactory performance of percutaneous biopsy of native and transplant kidneys entail:

- knowledge of indications for the procedure,
- obtaining informed consent,
- performance of the procedure itself including minimizing patient discomfort, and
- interpretation of results of the biopsy.
- ***Central venous access insertion for hemodialysis***

Satisfactory placement of vascular access entails:

- knowledge of informed consent,
- proper Seldinger technique,
- knowledge of vascular anatomy,
- minimizing patient discomfort, as well as
- functional catheter placement and recognize/manage complications
- ***Acute peritoneal dialysis catheter insertion***

Satisfactory placement of peritoneal catheter placement entails:

- knowledge of informed consent,
- proper technique,
- minimizing patient discomfort, as well as
- functional catheter placement.

In addition they should be able to perform independently the following:

To be able to write a prescription, conduct and supervise acute and chronic intermittent hemodialysis

- Entails knowledge of proper indications for hemodialysis,
- knowledge of first dialysis precautions,
- writing of dialysis order which includes choosing dialysis filters,
- estimating dry weight and modification during special circumstances (critically ill child, in-born errors of metabolism),
- choosing dialysate composition,
- understanding and treatment of complications, and
- modifying dialysis prescription for inadequate clearance in chronic hemodialysis patients.

To be able to write a prescription, conduct and supervise acute and chronic peritoneal dialysis:

- Entails knowledge of proper indications of peritoneal dialysis,

- writing orders for peritoneal dialysis which includes dialysis prescription (volume of dialysate, frequency of exchanges, and use of different hypertonic solutions),
- understanding and treatment of complications, and
- modifying dialysis prescription in special situations (lactic acidosis, metabolic disorders) and inadequate clearance in chronic peritoneal dialysis patients

To be able to write a prescription, conduct and supervise continuous renal replacement therapy (CRRT)

- Entails knowledge of proper indications of CRRT,
- writing orders for continuous renal replacement therapy (flow rate of dialysate, choosing ultrafiltration rate,
- choosing dialysate composition including the use of bicarbonate based solutions),
- understanding and treatment of complications, and
- modifying dialysis prescription for inadequate clearance in patients undergoing continuous renal replacement therapy

To be able to write a prescription, conduct and supervise slow low efficiency daily dialysis (SLED)

- Entails knowledge of proper indications of SLED,
- writing orders (flow rate of dialysate,
- choosing ultrafiltration rate,
- choosing dialysate composition,
- understanding and treatment of complications, and
- modifying dialysis prescription for inadequate clearance in patients undergoing SLED

To be able to write a prescription, conduct and supervise plasmapheresis

- Entails knowledge of proper indications of plasmapheresis,
- writing orders (volume of plasma replacement,
- choosing rate of plasmapheresis, monitoring,
- understanding and treatment of complications, and modifying plasmapheresis prescription based on the goal of plasmapheresis.

To be able to perform urine analysis at bedside

- To perform correctly urinalysis and interpret findings and to know the limitations of interpretation as applied to patient care.

Procedure	O	A	P	SJ
Renal biopsy				
Hemodialysis catheter access				
Acute peritoneal catheter insertion				
Urine analysis				

O- Observed; A- Assisted; P- Performed independently; SJ- Supervised junior colleague

4. TEACHING AND LEARNING METHODS

Clinical postings: Recommended schedule for three years training

The training of the post graduate student shall be a residency program with graded responsibility in the management of patients entrusted to his/her care. The participation of the students in all facets of the educational process is essential. The post graduate student shall take active part in seminars, group discussions, clinics, journal reviews, CPC and clinical meetings. The post graduate student shall also participate in training of post graduates, nursing and paramedical staff. They shall also be involved in research activities pertaining to the subject.

The post graduate student is required to work full time in the Department of Pediatric Nephrology, participate in the patient care and academic and research activities as described below. The trainee should attend not less than 80% (Eighty percent) of the training during the calendar year.

Orientation programme: The post graduate student would first familiarize himself/herself with the faculty of the department and other allied specialties; general working of the hospital, the Wards, admission norms, geography of the hospital, location of the various services, discharge protocol, ordering investigations and other administrative aspects that may be help in them during their training period.

The clinical postings will divided between the out-patient services, sub-specialty clinics, wards, dialysis, intensive care unit and electives.

The training will consist of intensive training in Clinical Nephrology in order to develop the fundamental skills and knowledge required to evaluate, diagnose and formulate management plans for various renal diseases in out-patient and in patient setting and in emergency cases. During the postings in ward, the DM student will be directly involved in patient care and present clinical cases to the faculty and receive one-on-one instruction and feedback in history taking, physical examination and management. The senior DM students will also engage in supervising and teaching junior colleagues. The faculty will interview, examine and discuss assessment and plans with the DM students for all inpatient consultations and emergency cases. The DM student will also undertake 24 hour calls as per the schedule of the department and will report to faculty on call. The student will also learn to counsel the patients and care takers. It will be the responsibility of the DM student to maintain documentation regarding the care of the patients treated in the unit. This will include preparation of discharge summaries, scheduling of treatment protocols for chronic diseases and transplant patients, and preparing medical reports.

During the postings, the DM student will perform various procedures initially under supervision of faculty or senior trainees and later independently like percutaneous renal biopsy of both native and transplanted kidneys, placement of temporary vascular access for hemodialysis or continuous renal replacement therapy, placement of peritoneal catheter for acute peritoneal dialysis, prescribing , supervising and trouble- shooting acute and chronic hemodialysis, peritoneal dialysis, continuous renal replacement therapy, plasmapheresis and performing urinalysis.

The total period of the course is 36 months. Of this, 30 months will be spent in the pediatric nephrology unit; 6 months will be meant for rotations in related specialties.

Suggested posting schedule

Mandatory

- | | |
|---|-------------|
| ○ Pediatric Nephrology including hemodialysis service | 30 months |
| ○ Pediatric Urology/Surgery | 1 month |
| ○ Adult Nephrology | 1-2 months |
| ○ Renal Pathology | 15 -30 days |

Electives (at least three of the below - 3 months)

- PICU/NICU
- Radiology
- Nuclear medicine
- Posting to an external Pediatric Nephrology unit
- Genetics
- Transplantation immunology and diagnostics

(i) Academic sessions: In addition to bedside teaching during clinical rounds and in out-patient setting, formal teaching is necessary. The departments may select a mix of the following; sessions:

Journal club/Review	Once a month
Medical audit	Once a month
Seminar; lecture	Twice in a month
Case discussions	Once a week
Interdepartmental case or seminar	Once a month
Attend accredited scientific meetings (CME, symposia, and conferences)	

Additional sessions on basic sciences, biostatistics, and research methodology, teaching methodology, medical ethics and legal issues related to pediatric nephrology are suggested.

- a) Journal Club/Review:** Once per month of 1 hour duration-. The presentation of journal club includes a brief review of the scientific context of the paper, the data, an analysis thereof, and a critique/discussion of the experimental approach/study design and results. In journal review, relevant articles from recommended journals are reviewed. Each post graduate student shall present at least 6 journal club/reviews in one academic year and attend at least 12 others.
- b) Seminars/Topic review:** Seminar twice every month of 1 hour duration. Aim is to provide didactic seminars on topics that cover the broad field of Pediatric Nephrology and includes basic sciences relevant to the topics being discussed. Each post graduate student shall present at least 6 seminars/symposia in one academic year and attend at least 12 others.
- c) Case presentation** in the ward once a week for one hour. Post graduate students will present a clinical case for discussion before a faculty and discussion made pertaining

to its management and decision to be recorded in case files. Alternatively, a case is selected and presented by a post graduate student (with faculty input) from those encountered by the post graduate student in hospital and in outpatient clinics. Important literature review associated with the case may also be presented. The case is analyzed in order to make key teaching points. Each post graduate student shall present at least 6 clinical cases in one academic year and attend at least 12 others.

- d) **Clinical renal pathology Conference:** Once a month of 1 hour duration. The biopsies performed during the preceding month will be discussed. The post graduate student will summarize the clinical aspects of the case followed by interpretation of the renal biopsy in conjunction with faculty from pathology. Each post graduate student shall present at least 6 cases in one academic year and attend at least 10 sessions.
 - e) **Inter-departmental seminar or Grand Round:** Presentation of cases in clinical combined / grand rounds (Neonatology, Pediatrics, Pediatric Surgery, Radiology, nutrition) once in a month. Each post graduate student shall present at least 3 cases in one academic year and attend at least 8 sessions.
 - f) **Mortality and Morbidity/Audit meet:** Once a month for one hour to discuss the mortality and departmental statistics.
- (ii) **Teaching in the out-patient setting, during clinical rounds:** The faculty should engage in briefly discussing with the post graduate students various common and uncommon cases presenting in the OPD. There would be at least one consultant-led ward round daily that includes referral in other departments and ICU. This would be a service round with individual case presentation and brief discussion. In addition, at least 02 teaching rounds per week are recommended involving detailed discussion on admitted clinical cases. Besides theoretical aspects, emphasis must be laid on bedside assessment and practical management issues.
- (iii) **Others:** These include non-formal teaching during the discussion on management strategies for specific sub groups of children with renal diseases.
- a) **Dialysis meets:** Once a fortnight for one hour to discuss the various aspects of the children undergoing maintenance hemodialysis or peritoneal dialysis.
 - b) **Transplant meets –** once a fortnight for one hour to discuss transplant workup and also discuss management issues in children who have been transplanted.

- (iv) **Conference, CME's and Workshops:** Participating and contributing to the organization of such meets is desirable. During the 3-year period of training; he/she should attend at least one national or international and one state level meet.
- (v) **Paper Presentation/ Publication:** During the training programme, the trainees must have presented at least one paper in a national or international conference and have at least one publication in a peer reviewed journal.
- (vi) **Teaching by trainees:** The post graduate student will assist and be involved in the teaching of under graduate medical/ nursing students and those training for MD (Paed). He/she will learn the use of various teaching – teaching media (eg. audiovisual aids) in this exercise.

5. LOG BOOK

The DM student shall maintain a log book of the work carried out by them and the training programme undergone during the period of training including details of procedures assisted or done independently by the trainees. The log book shall be checked and assessed periodically by the faculty members imparting the training. Maintenance of performance record in Log book is mandatory. Certified and assessed copy should be made available at the time of practical examination for review by examiners.

Log book should be made to contain:

1. Certificate duly signed by Head of department and Head of Institute stating Dr..... has worked in department from.....to.....for a period of 3 years. This performance record book contains authentic record of work done and assessment for last 3 years.
2. Record of training: Name of the trainee; Name of the Hospital; Training period; Name of guide.
3. Posting.
4. Working schedule.
5. Teaching programme.
6. Presentationat academic sessions (Journal club/Review, Seminars, Case presentation/conference, Audit, Teaching activity): Date, Topic/Article name, Prersenter/Attendee, Assessment.

7. Procedures: Date, Name of patient, Type, Complications observed. Mentioned if supervised / performed independently or supervised colleague during the procedure.
8. Participation in Research Activity: name of project, Duration.
9. Conference / Workshop attended: Date/Conference name/Place
10. Paper presentation / Publications.

ASSESSMENT

FORMATIVE ASSESSMENT, during the training programme

Formative assessment (periodic, multiple) is an internal assessment by the teaching faculty of the department. The faculty should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self-directed learning and ability to practice in the system.

Each trainee should attend regular appraisal meetings and reviews of their academic performances, competence progression and workplace based assessments by the faculty of the department. It is frequent, covers small content areas and provides immediate feedback to the teacher and the taught.

Assessment

- | | |
|--|-------------------------|
| • Personal attributes | 3-6 months |
| • Clinical skills and performance | 3-6 months |
| • Academic activities | 3-6 months |
| • Theory assessment | End of 12 and 24 months |
| • Practical assessment | -do- |

Personal attributes includes a broad assessment of general attitude, interest in work, initiative, responsibility and reliability, organizational ability, communication skills, professional attitude and team work.

Assessment of academic activities includes Journal based / recent advances learning, participation in departmental and interdepartmental learning activity, external and outreach activities and attending /presenting abstracts in CMEs and conferences.

Clinical skills and performance, academic performance and personal attributes shall be graded on a scale of 1 to 9 listed in DM student appraisal form (Annexure I). The academic presentations shall be graded at the time of presentation of the faculty in-charge. Evaluation on clinical skills including competency in procedures and personal attributes shall be done by the Unit in-charge at the end of every quarter.

SUMMATIVE ASSESSMENT, namely, assessment at the end of training

The summative examination should be carried out as per the Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000. The Post graduate examination shall be in two parts and will be as per the details given in Post Graduate Regulations, 2000.

Summative evaluation (terminal, single) is a combined assessment by the internal and external examiners designated by the NMC/Medical University of the State at the end of the course.

The DM examination shall be in two parts: Theory and Clinical / Practical and Oral/viva voce Examination.

1. **Theory:** There shall be four theory papers of three hours duration as follows:

Paper I: Basic Sciences as applied to the subject including physiology, anatomy, embryology epidemiology, pharmacology, biochemistry, pathology, genetics and biostatistics

Paper II: Clinical nephrology

Paper III: Dialysis, Transplantation and Nephro-urology

Paper IV: Recent advances in Pediatric nephrology

The theory examination shall be held in advance before the clinical and practical examination, so that the answer books can be assessed and evaluated before the commencement of the clinical/practical/oral examination.

Evaluation: The answer books shall be valued by two examiners or as per Rules of the University concerned. The average of the two marks secured by the post graduate student will be taken into account. If the difference between two marks exceeds 10%, the answer scripts shall be valued by the third examiner. The average of the nearest two marks shall be considered as the final mark.

2. **Practical:** The practical examination should consist of the following and should be spread over two days, if the number of candidates appearing is more than five. There will be one internal and two external examiners.

1. One long case: History taking, physical examination, interpretation of clinical findings, differential diagnosis, investigations, prognosis and management.
2. 2 short cases
3. Ward rounds for clinical, procedural and communication skills (4 cases)
4. Log Book Records and day-to-day observation during the training

Viva-voce Examination:

- Viva – Research related
- Instruments/Drugs
- Radiology/Nuclear imaging/Investigations
- Renal Pathology

RECOMMENDED READING:

Books (latest edition)

1. Diagnostic Atlas of Renal Pathology, Fogo, Agnes B 7th ED. Elsevier
2. Clinical Dialysis, Nissenson, Allen R, 4th ED. McGraw Hill.
3. Hypertension companion to Brenner & Rectors the Kidney, Oparil, Suzanne, Elsevier.
5. Disease of the Kidney & Urinary tract, Schrier, Robert W, Vol I, Lippincott.
6. Disease of the Kidney & Urinary tract, Schrier, Robert W, Vol II, Lippincott.
7. Disease of the Kidney & Urinary tract, Schrier, Robert W, Vol III, Lippincott.
8. Comprehensive Clinical Nephrology, Feehally, John, Mosby.
10. Seldin and Giebischs the Kidney: Physiology and Pathophysiology, Alpern, Robert. J, Vol I, Academic Publisher.

11. Seldin and Giebisch's the Kidney: Physiology and Pathophysiology, Alpern, Robert. J, Vol II, Academic Publisher.
12. Comprehensive Pediatrics Nephrology, Geary, Denis. F (ED), 1st ED. Elsevier.
13. Evidence-Based Nephrology, Molony, Donald. A, John Wiley.
14. Handbook of Dialysis, Daugirdas, John. T, Lippincott.
15. Oxford Handbook of Dialysis, Levy, Jeremy, 2nd ED. Oxford, 2007
16. Ganong's Review of Medical Physiology, Barrett, Kim. E (et al), McGraw Hill.
17. The Kidney, Brenner & Rector - Saunders.
18. Critical Care Nephrology, C. Ronco, Saunders.

Journals

3-5 International and 02 national journals (all indexed)

DM Student Appraisal Form

Pre / Para /Clinical Disciplines

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM.....TO.....

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1.	Journal based / recent advances learning				
2.	Patient based /Laboratory or Skill based learning				
3.	Self directed learning and teaching				
4.	Departmental and interdepartmental learning activity				
5.	External and Outreach Activities / CMEs				
6.	Research work				
7.	Log Book Maintenance				

Publications

Yes/ No

Remarks* _____

***REMARKS:** Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.

SIGNATURE OF ASSESSEE SIGNATURE OF CONSULTANT SIGNATURE OF HOD

**NATIONAL MEDICAL COMMISSION
Postgraduate Medical Education Board**

D 11011/1/21/AC/Guidelines 04

Date: 02-06-2021

**GUIDELINES FOR COMPETENCY BASED
POSTGRADUATE TRAINING
PROGRAMME FORM.Ch. IN SURGICAL
GASTROENTEROLOGY**

DRAFT

**GUIDELINES FOR COMPETENCY BASED
POSTGRADUATE TRAINING PROGRAMME FOR M.Ch.
IN SURGICAL GASTROENTEROLOGY**

1. PREAMBLE

The aims and objectives of M.Ch. training should be to train surgeons with adequate knowledge, skills, aptitude and attitudes in the specialty of Surgical Gastroenterology. They should be able to function as an independent clinician/consultant and a teacher with research skills.

2. SUBJECT SPECIFIC OBJECTIVES

During the course, the student should acquire the following knowledge/skills/expertise:

- A. THEORETICAL KNOWLEDGE:**
Should be able to describe & discuss and synthesize knowledge regarding Luminal and HepatoPancreato Biliary (HPB) diseases (benign and malignant), and their diagnosis and management.
- B. CLINICAL/PRACTICAL SKILLS:**
Should be able to diagnose, investigate, manage and follow-up patients with Luminal and HPB diseases (benign and malignant) using modern therapeutic methods.
- C. TEACHING SKILLS:**
Should be able to teach relevant aspects of Luminal & HPB diseases (benign and malignant) to resident doctors, junior colleagues, nursing and para-medical staff.
- D. RESEARCH METHODOLOGY:**
Should be able to identify and investigate a research problem in Luminal & HPB diseases (benign and malignant) using appropriate methodology.
- E. GROUP APPROACH:**
Should participate in multi-disciplinary meetings with radiologists, pathologists, medical gastroenterologists, oncologists and experts from allied clinical disciplines.
- F. ATTITUDES INCLUDING COMMUNICATION SKILLS**
Should be able to communicate effectively with patients, colleagues and the community about Luminal & HPB diseases (benign and malignant) as well as counsel patients and relatives about various decisions during management.

3. LEARNING OBJECTIVES

At the end of the M.Ch. (Surgical Gastroenterology) training, the candidate should:

- a. Be able to diagnose, investigate, manage and follow up patients with Luminal & HPB diseases (benign and malignant) using relevant current therapeutic methods with confidence.
- b. Be able to interpret data from relevant clinical/laboratory investigations.
- c. Be able to describe & discuss the indications/contraindications of common Luminal & HPB surgical procedures for benign and malignant diseases and have the skills to perform these operations (including minimal access).
- d. Be able to discuss the current literature on relevant aspects of the investigative, clinical and operative management of Luminal & HPB diseases (benign and malignant).
- e. Be aware of all sub-specialties of Luminal & HPB surgery including transplantation.
- f. Be acquainted with allied and general clinical disciplines.
- g. Be capable of imparting basic Luminal & HPB surgical training.
- h. Be able to identify, plan, conduct and communicate research in Luminal & HPB diseases.
- i. Be able to discuss and defend the ethical issues involved in the relationship between patients and peers in clinical practice and research.

4. COMPETENCIES

SUBJECT SPECIFIC COMPETENCIES

4.1.1 Competencies to be acquired in the cognitive domain (knowledge)

- a. Establish rapport, obtain a complete and relevant history; and perform a thorough physical examination adapted to the patient's clinical situation to arrive at a tentative diagnosis and list of probable differential diagnosis.

Implied sub-competencies:

- Obtains appropriate data from patient or caregiver
- Establishes rapport
- Performs appropriate physical examination
- Demonstrates specific physical examination skills
- Integrates all the above
- Lists diagnostic possibilities, identifying the most likely
- Justifies the principal diagnosis
-

- b. Plan and order relevant sequential investigations and Interpret their results to confirm a working diagnosis and initiate a plan of management. Communicate the same to the patient and relatives.

Implied sub-competencies:

- Recognizes significant urgent or abnormal results
- Distinguishes between normal variation and abnormal results

- Formulates an appropriate preliminary opinion based on the results
- Communicates significant results to other team members
- Communicates results in a clear and comprehensible manner to patients and care givers.
- Proposes evidence informed, holistic initial management plans that includes pharmacologic and non-pharmacologic components, taking in to account patient's context, patient's consent and values
- Prioritizes the various component of the management plans
- Reviews the plan with other members of the team

c. Present oral and written reports that document a clinical encounter.

Implied sub-competencies:

- Documents approved management plans in the form (written / electronic), prescriptions and consultations / referrals
- Uses the electronic record when available to keep the team informed of progress
- Follows principles of error reduction including discussions of indications / contraindications of treatment plans, possible adverse effects proper dosage and drug interactions
- Writes consults / referrals, orders or prescriptions which are complete, incorporate patient safety principles and that can be understood by all members of the team including the patient
- Presents a concise and relevant summary of a patient encounter to members of health care team

d. Communicates effectively with patients and relatives

Specifies patient context in report

- Demonstrates a shared understanding among the patient, the health care team members and consultants through oral and written reports
- Documents findings in a clear, focused and accurate manner
- Realize and execute a Proper handing over procedure to the next care giver so that patient care is continuous and uninterrupted
- Obtain a proper informed consent for the planned line of management after explaining alternatives to the patients
- Be prepared to alter the plan of management based on response from the patient
- Prepare patients for surgical and other procedures as well as manage their peri /post-operative and rehabilitative periods. Communicate a proper follow up plan
- Recognize a patient requiring urgent or emergent care, provide initial management and seek help as required

Implied sub-competencies:

- Utilizes early warning scores or rapid response team / medical emergency team criteria to recognize patients at risk of deterioration and mobilizes appropriate resources urgently
- Performs basic life support including CPR in cardiac arrest

- Asks for help when uncertain or requiring assistance
- Involves team members required for immediate response, continued decision making and necessary follow up
- Initiates and participates in a code response
- Rapidly assesses and initiates management steps
- Documents patient's assessment and necessary interventions in record
- Updates family members to explain patient's status and escalation of care plans
- Clarifies patient's goals of care upon recognition of deterioration
- Recognize a situation where a patient needs referral for appropriate management
- Participate in health quality improvement initiatives including auditing one's own practice

Implied sub-competencies:

- Participates in morbidity and mortality rounds
- Enters information in an error-based system
- Engages in daily safety habits like universal precautions, hand washing, time outs etc.
- Recognizes one's own errors to the supervisor/team, reflects on one's contribution and develops his/her own plan or quality improvement plan
- Identifies a risky situation for the safety of a patient
- Participates in a quality improvement exercise/project

e. Collaborate as a member of an inter-professional team. Is actively involved in care coordination

Implied sub-competencies:

- Recognizes the value and contributions of all team members
- Actively strives to integrate in to the team
- Recognizes the value and contributions of all team members
- Seeks input and help from all team members as needed
- Adapts communication strategies to the recipient in content, style and venue contributing to good interactions with team members
- Listens actively and elicits ideas and feedback from all team members
- Anticipates and responds to emotions in typical situations
- Rarely shows lapses in professional conduct except in unanticipated situations that evoke strong emotions and has insight to use experience to learn to anticipate and manage future triggers
- Works toward achieving team goals, although this may be more difficult when personal goals compete with team goals
- Usually involves patients / caregivers and other members of the team in goal setting care plan development
- Shares his knowledge of community resources with patients, family and other members of team
- Is actively involved in care coordination

- f. Displays honesty, compassion, respect and empathy for patients and relatives.
- g. Recognizes medico-legal issues, patient confidentiality and other regulations pertaining to medical practice.
- h. Evaluate published evidence and appropriately apply it to one's clinical practice
- i. Plan a study, collect data, record & analyze data and discuss one's findings in comparison to available evidence. Make a verbal and written communication.
- j. Teach relevant aspects of GIsurgery to resident doctors, junior colleagues, nursing, and para-medical staff.
- k. Effectively communicate with patients, colleagues and community about GI Surgery disorders as well as counsel patients and relatives about various decisions during management.
- l. Understand factors for hospital infection and take appropriate universal precautions to prevent hospital infection.
- m. Performs general procedures of a physician.

Implied sub-competencies:

- Demonstrates the necessary skills to perform the procedure and has good understanding of the indications, contraindications, the risks and the benefits of the procedure
- Anticipates and recognizes the complications associated with the procedure and seeks help appropriately
- Explains the procedure to the patient/caregiver in a language that is familiar to them and such that they understand the risks associated with the procedure
- Answers all the questions of patient/caregivers clearly
- Documents the procedure with all relevant details

4.1.2 Competencies to be acquired in the Upper GI tract diseases, both benign and malignant

- a) Provide initial management for critically ill UGI surgical patients
- b) Provide initial management for Upper GI trauma patients
- c) Assess and perform risk optimization for pre-operative patients in preparation for upper GI surgery
- d) Manage uncomplicated post-operative UGI surgical patients
- e) Manage post-operative UGI patients with complications
- f) Supervise junior learners in the clinical setting

4.1.3 Competencies to be acquired in the Lower G I tract diseases, both benign and malignant

Provide initial management for critically ill LGI surgical patients

- a) Provide initial management for Lower GI trauma patients

- b) Assess and perform risk optimization for pre-operative patients in preparation for Lower GI surgery
- c) Manage uncomplicated post-operative LGI surgical patients
- d) Manage post-operative LGI patients with complications
- e) Supervise junior learners in the clinical setting

4.1. 4.The Liver

A. Anatomy, Embryology, Physiology, Investigations

Upon completion of this, the trainee should be able to describe & discuss:

1. Intrahepatic and extrahepatic anatomy of the liver and the relationship with the adjacent structures
2. The embryology of the liver and biliary tract and the potential anomalies
3. The physiology of the liver
4. Clinical hematologic and biochemical tests relevant to the liver and their indications and interpretation.
 - Tests of hepatocellular injury
 - Tests of liver function
5. Hepatic imaging techniques and their indications and interpretation
6. Implications of investigations and surgical procedures on the liver

B. Congenital and Acquired Non-neoplastic Liver Disease

Upon completion of this, the trainee should be able to describe & discuss:

1. The pathophysiology, presentation and natural history of the congenital and acquired non-neoplastic diseases of the liver.
2. The investigative procedures available to efficiently diagnose the disease/disorder.
3. The treatment options available for the condition and the results, including the risks and benefits of the operative and non-operative procedures.
4. The pre-, intra- and post-operative management, including the management of complications of therapy.

C. Neoplastic Liver Disease

Upon completion of this, the trainee should be able to describe & discuss:

1. The pathophysiology, presentation and natural history of benign, primary and secondary malignant neoplasms of the liver.
2. The investigative procedures available to efficiently diagnose the disease/disorder.
3. The staging of malignancies of the liver including histologic assessment.
4. The treatment options available for the neoplasm and the results, including the risks and benefits of the operative and non-operative procedures.
5. The pre-, intra- and post-operative management, including the management of complications of therapy.
6. The role of neo-adjuvant and adjuvant therapy of malignant liver neoplasms.

D. Liver Surgery for both benign and malignant diseases

Upon completion of this, the trainee should be able to describe & discuss:

1. The types of and techniques for liver resections
2. Preoperative patient assessment and the cumulative risks of the proposed procedure
3. Preoperative management
4. Intra-operative management during a liver resection
5. Post-operative management including complications.

4.1. 5 The Biliary Tract including Gallbladder

A. Anatomy, Embryology, Physiology, Investigations

Upon completion of this, the trainee should be able to describe & discuss:

1. The anatomy of the biliary tract including the intra- and extra-hepatic ducts, the gallbladder and cystic duct, the ampulla of Vater, and their relationships with the adjacent structures
2. The embryology of the liver and biliary tract and the potential anomalies
3. The physiology of bile metabolism and biliary tract epithelium
4. Clinical biochemical tests relevant to the biliary tract and their interpretation
5. Biliary imaging techniques and their indications and interpretation
6. Implications of investigations on surgical procedures on the bile duct

B. Congenital and Non-neoplastic Biliary Disease

Upon completion of this, the trainee should be able to describe & discuss:

1. The pathophysiology, presentation and natural history of congenital and acquired non-neoplastic diseases of the biliary tract including the gallbladder
2. The investigative procedures available to efficiently diagnose the disease/disorder
3. The treatment options available for the condition, and the outcomes, including the risks and benefits of the operative and non-operative treatments
4. The pre-, intra- and post-operative management, including the management of complications of therapy

C. Neoplastic Biliary Disease

Upon completion of this, the trainee should be able to describe & discuss:

1. The presentation and natural history of benign and malignant neoplasms of the bile duct and gallbladder
2. The investigative procedures available to efficiently diagnosis the neoplasm.
3. The staging of adenocarcinoma of the bile duct and gallbladder including histologic assessment
4. The treatment options available for the neoplasm, and the indications and outcomes, including the risks and benefits of the operative and non-operative treatments

5. The pre-, intra- and post-operative management, including the management of complications of surgery.
6. The role of neo-adjuvant and adjuvant chemotherapy and radiation in malignant biliary neoplasms

4.1.6 The Pancreas & Duodenum

A. Anatomy, Embryology, Physiology, Investigations

Upon completion of this, the trainee should be able to describe & discuss:

1. Anatomy of the pancreas and its relationship with portal structures, retroperitoneal structures and the adjacent organs
2. Anatomy of the pancreatic duct and its relationship with the bile duct, sphincter of Oddi and the ampulla of Vater
3. Anatomy of duodenum and its relationship with portal structures, retroperitoneal structures and the adjacent organs
4. The embryology of the pancreas, pancreatic duct and duodenum and potential anomalies
5. The physiology of pancreatic endocrine and exocrine functions and duodenal physiology
6. Clinical biochemical tests of pancreatic function and injury and their interpretation
7. Pancreatic and duodenal imaging techniques and their indications and interpretation
8. Implications of investigations on surgical procedures on the pancreas and duodenum

B. Congenital and Acquired Non-neoplastic Pancreatic Disease

Upon completion of this, the trainee should be able to describe & discuss:

1. The pathophysiology, presentation and natural history of congenital and acquired non-neoplastic diseases of the pancreas
2. The investigative procedures available to efficiently diagnose the disease/disorder
3. The treatment options available for the condition, and results, including the risks and benefits of the operative and non-operative procedures
4. The pre-, intra- and post-operative management, including the management of complications of therapy

C. Neoplastic Diseases of the Pancreas

Upon completion of this, the trainee should be able to describe & discuss:

1. The pathophysiology, presentation and natural history of benign, primary and secondary malignant neoplasms of the pancreas
2. The investigative procedures available to efficiently diagnose the disease/disorder
3. The staging of malignancies of the pancreas including histologic assessment

4. The treatment options available for the neoplasm, and the outcomes, including the risks and benefits of the operative and non-operative procedures
5. The pre-, intra- and post-operative management, including the management of complications of therapy

D. Diseases of the Duodenum

Upon completion of this unit the trainee should be able to describe & discuss:

1. The pathophysiology, presentation and natural history of the diseases of the pancreas
2. The investigative procedures available to efficiently diagnose the disease/disorder
3. The treatment options available for the condition, and the results, including the risks and benefits of the operative and non-operative procedures
4. The pre-, intra- and postoperative management, including the management of complications of therapy

4.1. 7 Imaging

Upon completion of this, the trainee should:

1. Be able to describe & discuss the physics and technology of Ultrasound and Doppler, CT scan, MRI scan, PET scan and the other nuclear medicine imaging procedures including biliary excretion scan (HIDA), RBC scan, octreotidescan, and liver/spleen scan
2. Be able to describe & discuss the relative advantages, disadvantages and indications of each
3. Read and interpret the detailed information provided by imaging of the liver, biliary tract, pancreas and duodenum
4. Perform and interpret intra-operative ultrasound

4.1.8 Oncology

Upon completion of this, the trainee should:

1. Be able to describe & discuss the basic pathophysiology of neoplasia and the currently understood mechanisms of carcinogenesis
2. Be able to describe & discuss the mechanisms of action of the classes of chemotherapeutic agents currently available for HBP malignancies
3. Be able to describe & discuss the physics, mechanism of action and technology of radiation therapy
4. Apply this knowledge to the multidisciplinary management of HBP malignancies

4.1.9 Trauma

Upon completion of this unit the trainee should be able to describe & discuss:

1. The pathophysiology of blunt and penetrating trauma to the liver, biliary tract and portal structures, pancreas, duodenum and adjacent structures

2. The methods of assessment and diagnosis
3. The principles and techniques available to manage traumatic injuries
4. The management of complications of trauma to the liver, biliary tract, pancreas and duodenum

4.1.10 Transplantation

Upon completion of this, the trainee should be able to describe & discuss:

1. Organ procurement and preservation
2. Indications for liver transplantation
3. Outcomes including complications of transplantation
4. Immuno-suppression and its toxicities

4.2 AFFECTIVE DOMAIN (ATTITUDES AND VALUES DOMAIN)

The trainee in M.Ch. in Surgical Gastroenterology course is expected to acquire following attitudes and values.

1. Should follow ethical standards in managing patients
2. Should be able to identify, discuss and communicate ethical issues involved in a surgeon-patient relationship
3. Should be able to undertake self-appraisal and rectify any shortcomings.

4.3 Psychomotor Domain (Skills domain)

The trainee in M.Ch. in Surgical Gastroenterology course is expected to acquire the following procedural and non-procedural skills in GI and HPB diseases and perform these independently:

1. Clinical examination
2. Minor surgery
3. Major surgery
4. Endoscopic procedures
5. Physiological studies
6. Radiological procedures

Psychomotor domain (skills domain) will overlap with the cognitive and affective domains, as the performance of any skill will require all three domains

4.3.1 Upper GI

- a) Assessment of patients with gastro-esophageal reflux disease (GERD) and Barrett's disease and to carry out non-operative and perioperative management for GERD and Barrett's disease.
- b) Assessment of patients with para-esophageal hernia and congenital diaphragmatic hernias - investigations and management.
- c) Assessment of patients with acute corrosive ingestion and chronic corrosive strictures and carry out non-operative, endoscopic and perioperative management.

- d) Assessment of patients with motility disorders of pharynx and esophagus and to carry out non-operative and perioperative management of motility disorders.
- e) Assessment of patients with esophageal cancer and to carry out non-operative and perioperative management of esophageal cancer.
- f) Assessment of patients with peptic ulcer disease and to carry out the non-operative, endoscopic and perioperative management of peptic ulcer disease.
- g) Assessment of patients with GE junction tumors and to carry out non-operative and perioperative management of GE junction tumors.
- h) Assessment of patients with gastric cancer and to carry out the non-operative and perioperative management of gastric cancer.
- i) Assessment of patients with gastrointestinal stromal tumors (GIST) of the stomach, esophagus and duodenum and carry out non-operative and perioperative management.
- j) Assessment of patients with benign tumors of the esophagus, stomach and duodenum and to carry out the non-operative and perioperative management of benign tumors of the esophagus, stomach and duodenum.
- k) Assessment of patients with premalignant conditions of the esophagus, stomach and duodenum and to carry out the non-operative and perioperative management of premalignant conditions of the esophagus, stomach and duodenum.
- l) Assessment of patients with morbid obesity and to carry out the non-operative and perioperative management of morbid obesity.
- m) Insertion of laparoscopic ports or making abdominal wall incisions appropriate for the intended procedure.
- n) Laparoscopic intracorporeal and extracorporeal suturing.
- o) Principles and interpretation of endoscopic ultrasound (EUS) for upper GI indications.
- p) Endoscopic dilatation, foreign body removal, clipping, glue techniques.
- q) Perform safely/satisfactorily fundoplication/myotomy.
- r) To perform safely/satisfactorily esophageal resections.
- s) To perform safely/satisfactorily peptic ulcer surgery by open/laparoscopic techniques.
- t) To perform safely/satisfactorily foreign body removal, endoscopic dilatation, banding of esophageal varices.
- u) To perform safely/satisfactorily gastric resections.
- v) To perform safely/satisfactorily gastric volvulus surgery by open/laparoscopic techniques.
- w) To perform safely/satisfactorily laparoscopic sleeve gastrectomy, Roux-en-Y bypass for obesity.

4.3.2. Colorectal

- a) Assessment of patients with anorectal pain, discharge and bleeding—Clinical evaluation (Knowledge of causes, history eliciting, per rectal examination with concern for the patient, make a diagnosis).
- b) Assessment of patients with rectal prolapse: Knowledge about pathophysiology, various treatment procedures, history and examination, should be able to differentiate

from other conditions, relevant investigations and interpretation, algorithmic approach in management, choosing the treatment option with justification relevant to the patient.

- c) Assessment of patients with pelvic floor and sphincter disorders: Knowledge of definition, diagnostic criteria, history and examination of patient, rational ordering of investigations and interpretation of investigations, choosing the appropriate treatment, discussion with patient.
- d) Assessment of patients with colonic diverticulosis: (anatomical abnormality, pathophysiology, presentation, treatment options, algorithmic approach to treatment).
- e) Assessment of patients with rectal injury including foreign body: Evaluation of extent of injury, investigation and interpretation of the results, decision for surgery and nature of surgery.
- f) Assessment of patients with colonic polyp: Knowledge of various types of polyps and syndromes. Algorithmic approach to management of polyps.
- g) Evaluate a patient with large bowel obstruction with clinical examination, enlist possible causes, demonstrate rational use of investigations and their interpretation and plan management strategies.
- h) Evaluate a patient with lower GI bleed, localize the site of bleeding and have an algorithmic approach in a case of lower GI bleeding.
- i) Evaluate a patient with inflammatory bowel disease (IBD), plan management and counsel the patient regarding management and associated complications.
- j) Evaluate a patient of carcinoma rectum and anal canal, have a sound knowledge of multimodal treatment protocols and management of metastatic rectal carcinoma.
- k) Management of a stoma and its complications, know the indications and methods of creating/reversing different types of stomas.
- l) Ability to do colonic and rectal mobilization including understanding the vascular basis of it.
- m) Colorectal anastomotic techniques including use of staplers.
- n) Creation of different pouches and their complications.
- o) Trans-anal procedures- indications & methodology.
- p) Evaluation and management of acute & chronic mesenteric ischemia.
- q) Small bowel obstructions: evaluation & management due to inflammatory diseases & tumours.
- r) Ability to assess and manage enterocutaneous fistulae.
- s) Assessment of patients with short bowel syndrome and manage them.

4.3.3.Liver

A. Clinical Skills: General

1. Identify, recognize, and describe anatomic structures in and around the liver
 - a) By reading and interpreting images of the liver
 - b) Intraoperatively
2. Perform and interpret intraoperative ultrasound of the liver and porta hepatis.
3. Perform liver biopsy: percutaneous, laparoscopic or open.
4. Identify anatomic anomalies and explain their embryologic origin.
5. Be able to describe & discuss the indications for and be able to interpret the haematologic and biochemical tests and explain the underlying physiology
6. Interpret dynamic tests of liver function.

7. Apply relative advantages and disadvantages to the application of different modalities of hepatic imaging.
8. Determine the appropriate abdominal wall incisions for open procedures on the liver.
9. Determine the appropriate port site placements and patient positions for laparoscopic procedures on the liver, and the relative indications for each and the need for a hand-port.
10. Evaluate liver function and portal hypertension (including Child's score and its variations).
11. Assess the overall risk and the hepatic risk of surgery by recognizing the implications of abnormalities of haematologic and biochemical investigations on both hepatic and non-hepatic procedures.
12. Develop a detailed operative strategy for liver resections based on preoperative assessment and imaging.
13. Diagnose and treat patients with cystic diseases of the liver.
14. Diagnose and manage patients with liver abscess(es).
15. Perform laparoscopic and open drainage of liver cyst or abscess (deroofting, resection).
16. Diagnose and classify acute and chronic liver failure.
17. Diagnose, investigate and manage patients with portal hypertension.
18. Perform portosystemic shunts: portocaval, mesocaval, splenorenal and their variants.
19. Perform devascularisation procedures and their variants.

B. Clinical Skills: Neoplasms

1. Evaluate patients with benign neoplasms of the liver, including interpretation of imaging and indications for biopsy
2. Manage patients with benign hepatic neoplasms
3. Evaluate patients with hepatocellular carcinoma (HCC), including screening for potential HCC and staging
4. Evaluate patients with primary and secondary adenocarcinoma and other metastatic lesions of the liver including staging
5. Manage patients with primary and secondary hepatic malignancies
6. Participate in multidisciplinary tumour review board meetings
7. Perform liver resections
8. Provide pre- and postoperative therapy following liver resection including the diagnosis and management of complications
9. Recommend appropriate therapy for unresectable hepatic malignancies
10. Recommend appropriate adjuvant radiation and/or chemotherapy following resection for hepatic malignancies
11. Interact with medical and radiation oncologists

4.3.4. Biliary Surgery

A. Clinical Skills: General

1. Identify and describe biliary tract structures (normal and abnormal)

- a. By reading and interpreting images of the biliary tract
 - b. Intraoperatively
- 2. Perform and interpret intraoperative ultrasound of the biliary tract
- 3. Identify anatomic anomalies and explain their embryologic origin
- 4. Be able to describe & discuss the indications for and be able to interpret the biochemical tests and explain the underlying physiology
- 5. Apply the knowledge of the relative advantages and disadvantages of the different modalities of biliary tract imaging to determine the optimal investigation
- 6. Determine the abdominal wall incisions that are appropriate for open procedures on the biliary tract and the relative indications for each
- 7. Determine the appropriate port site placements and patient positions that are useful for laparoscopic procedures on the biliary tract and the relative indications for each
- 8. Develop a detailed operative strategy for biliary surgery based on preoperative assessment and imaging

B. Clinical Skills: Non-Neoplastic

1. Investigate the jaundiced patient by determining the most efficient modalities, and interpret the results of biochemical investigations and imaging
2. Apply the knowledge of the relative advantages and disadvantages of non-operative biliary manipulation (PTBD and endoscopic stenting) to treat biliary tract obstruction.
3. Manage the patient with complex gallstone disease
4. Manage biliary injuries resulting from cholecystectomy and other trauma
5. Perform resection and reconstruction for choledochal cysts, intrahepatic stones and benign strictures
6. Evaluate and manage the patient with complications of primary sclerosing cholangitis

C. Clinical Skills: Neoplastic

1. Investigate and manage patients with gallbladder polyps and benign neoplasms of the ampulla of Vater
 - a. Perform extended cholecystectomy for potential oncologic indication
 - b. Perform transduodenal resection of the ampulla of Vater with reconstruction of the biliary and pancreatic ducts
2. Investigate and manage patients with hilar cholangiocarcinoma
 - a. Perform extended resection of the biliary bifurcation with the caudate and ipsilateral lobes of the liver, portal lymphadenectomy, and biliary reconstruction
3. Investigate and manage patients with distal bile duct tumours
 - a. Perform pancreatoduodenectomy
4. Participate in multidisciplinary tumour review board meetings
5. Provide postoperative management including the diagnosis and treatment of complications of biliary resection and/or bypass
6. Recommend appropriate adjuvant radiation and/or chemotherapy following resection and interact with medical and radiation oncologists
7. Recommend appropriate palliative therapy for unresectable carcinoma of the gall bladder or bile duct

4.3.5. Pancreas and Duodenum

A. Clinical Skills: General

1. Identify, recognize, and describe anatomic structures in and around the pancreas and duodenum
 - a. By reading and interpreting images of the duodenum, pancreas and its duct
 - b. Intraoperatively
2. Perform and interpret intraoperative ultrasound of the pancreas and surrounding structures
3. Identify anatomic anomalies and explain their embryologic origin
4. Be able to describe & discuss the indications for and interpret biochemical tests and explain the underlying physiology including the tests of pancreatic function
5. Apply the relative advantages and disadvantages of different modalities of pancreatic imaging to efficiently investigate diseases and disorders of the pancreas and duodenum
6. Determine the appropriate abdominal wall incision for open procedures on the pancreas and/or duodenum
7. Determine the appropriate port site placements and patient positions for laparoscopic procedures on the pancreas and/or duodenum and the relative indications for each and the need for a hand-port
8. Develop a detailed operative strategy for pancreatic and duodenal surgery based on preoperative assessment and imaging

B. Clinical Skills: Non Neoplastic

1. Manage patients with acute pancreatitis, including complications
 - a. Determine the need for surgical intervention
 - b. Perform open and/or laparoscopic procedures for acute pancreatitis
2. Investigate and manage patients with chronic pancreatitis
 - a. Determine the need for operative intervention
 - b. Perform: pseudocyst-enterostomy, lateral pancreaticojejunostomy with/without limited resection of the head of the pancreas (Frey procedure), pancreatic resection

C. Clinical Skills: Neoplastic

1. Investigate and manage patients with benign cysts and neoplasms of the pancreas
 - a. Determine need for biopsy/aspiration and resection
 - b. Perform resections including enucleation of neuroendocrine tumours and spleen preserving distal pancreatectomy
2. Investigate and manage patients with adenocarcinoma of the pancreas
 - a. Stage the tumour pre- and intraoperatively and determine resectability
 - b. Perform pancreatoduodenectomy with or without portal vein resection and reconstruction
 - c. Perform distal pancreatectomy and regional lymphadenectomy
 - d. Perform palliative procedures for unresectable tumours
3. Participate in multidisciplinary tumour review board meetings

4. Provide postoperative management including the diagnosis and treatment of complications of pancreatic resection and/or bypass
5. Recommend appropriate therapy for unresectable pancreatic carcinoma
6. Recommend appropriate neo- and adjuvant radiation and/or chemotherapy and interact with medical and radiation oncologists

D. Clinical Skills: Duodenum

1. Investigate and manage patients with benign lesions of the duodenum
2. Determine need for operative intervention
3. Perform acid-reduction procedures, limited resection and duodenal bypass procedures
4. Investigate and manage patients with malignant neoplasms of the duodenum
 - a. Stage the tumour pre- and intraoperatively and determine resectability
 - b. Perform appropriate resection (including pancreatoduodenectomy with or without portal vein resection and reconstruction when necessary) with regional lymphadenectomy
 - c. Perform palliative procedures for unresectable tumours
 - d. Participate in multidisciplinary tumour review board meetings
 - e. Recommend appropriate therapy for unresectable duodenal malignancies
 - f. Recommend appropriate neo- and adjuvant radiation and/or chemotherapy and interact with medical and radiation oncologists
5. Provide postoperative management including the diagnosis and treatment of complications of duodenal resection and/or bypass

4.3.6. Imaging

Clinical Skills

1. Apply understanding of the relative merits of each imaging modality to efficiently investigate (including stage) lesions of the liver, biliary tract and pancreas
2. Interpret images to correctly identify normal structures, anomalies and pathologic abnormalities
3. Correlate and integrate the findings of the various imaging studies during the investigation of a patient
4. Perform and interpret intraoperative ultrasound
5. Interact with diagnostic radiologists with expertise in HPB diseases and body imaging

4.3.7. Oncology

Clinical Skills

1. Apply knowledge of tumour biology, chemotherapy and radiation therapy to recommend an appropriate treatment strategy for the management of individual HPB malignancies
2. Participate regularly in multidisciplinary tumour board meetings
3. Interact with interventional radiologists, medical oncologists, radiation oncologists, oncology nurses and allied health professionals, palliative care physicians and nurses

4.3.8. Trauma

Clinical Skills

1. Consult and manage patients with blunt and penetrating trauma to the upper abdomen
2. Evaluate injuries to the liver, biliary tract, pancreas and duodenum
3. Evaluate post-cholecystectomy injuries to the bile duct and determine a management strategy
4. Perform emergency and elective operative procedures to resolve and/or repair injuries to the liver, bile duct, portal structures, pancreas and duodenum
5. Manage complications of operative interventions

4.3.9. Transplantation

Clinical Skills

1. Apply knowledge of liver transplantation to recommend a liver transplant to the appropriate patient at the appropriate time.
2. Recognize the oncologic impact of immunosuppression on recurrence of hepatocellular carcinoma following liver transplantation and the increased risk of de-novo malignancies

5. SYLLABUS

5.1 BASIC SCIENCES AND PRINCIPLES OF SURGICAL GASTROENTEROLOGY and GI ONCOLOGY

- Anatomy: Gross and histological anatomy of the abdomen and its contents including the entire GI tract, Liver (including segmental anatomy), Biliary tract, Pancreas, spleen, portal and Hepatic venous system.
- Physiology: Normal function of the GI tract and related organs including endocrine functions of gut and pancreas. Physiological basis of various tests to study these functions
- Pharmacology of drugs used in GI surgical disorders e.g. to control acid secretion, in the management of ulcerative colitis and immunosuppressive drugs.
- Fluid-electrolyte and acid base disturbance: general aspects, imbalance in GI surgical patient's physiological responses to volume and osmolality abnormalities, interpretation of blood gas analysis, maintenance and replacement therapy.
- Nutritional considerations in GI surgical patients: nutrient stores and body compositions, nutrient requirements, malnutrition, evaluation of nutritional status, nutritional therapy, enteral and parenteral therapy and complications of these.
- Wound healing: Principles, phases, types of healing, factors influencing wound healing, wound dehiscence and management.
- Principles and disorders of hemostasis.
- Immunology in GI surgery. Especially in relation to organ transplantation and GI Oncology

5.2 Oesophagus

- Anatomical detail, physiology of swallowing, oesophageal manometry, pH monitoring, endoscopic ultrasound and other diagnostic techniques, brush cytology, vital staining, contrast imaging and CT scan,
- Congenital lesions (trachea-oesophageal fistula), Zenker's diverticulum, epiphrenic diverticulum, oesophageal trauma, spontaneous or iatrogenic perforations, esophageal motility disorders
- Corrosive burns: detection, evaluation and management,
- Gastroesophageal reflux disease, achalasia, cardia. Barrett's oesophagus, oesophageal cancer: adeno & squamous, various oesophageal operations: diverticulectomy, excision of leiomyoma, oesophagostomy, myotomy, fundoplication, oesophageal resection (Ivor-Lewis, McKeown, Trans-hiatal)
- Cervical exploration, oesophagostomy, gastric pull-up, gastric and colonic bypass, complications of oesophagectomy, management of chylothorax.

5.3 Stomach and Duodenum

- Anatomical details, physiology of gastric secretions, gastroduodenal motility, diaphragmatic hernia (congenital and acquired), volvulus, pyloric stenosis in children and adults, foreign bodies (bezoars), stomach trauma,
- H. pylori in gastric diseases, peptic ulcer, Zollinger-Ellison syndrome, non-ulcer dyspepsia
- Gastric tumours: benign and malignant, gastric surgery: vagotomy, pyloric drainage, gastrojejunostomy
- Bariatric procedures, Creation of gastric tube, Roux-en-Y oesophagojejunal anastomosis, post-gastrectomy syndromes and complications

5.4 The Liver

A. Anatomy, Embryology, Physiology, Investigations

1. Embryology of the liver and relationship to other foregut structures
2. Extrahepatic anatomy of the liver
 - Lobes, sectors, segments
 - Nomenclature systems
 - Ligaments, fissures and incisures
 - Anomalies
3. Anatomy of the porta hepatis
 - Portal vein, hepatic artery

- Bile duct, gall bladder
- Variants of normal and anomalies
- Lymphatic drainage and lymph nodal anatomy
- Nerves
- 4. Anatomy of the retrohepatic space
 - IVC and its branches
 - Adrenal, kidney, diaphragm
- 5. Intrahepatic anatomy
 - Hepatic veins and variants of normal
 - Portal triad structures and segmental anatomy
 - Histology of the normal liver
- 6. Physiology of the liver
 - Bilirubin metabolism
 - Coagulation
 - Other clinically relevant metabolic pathways
- 7. Haematologic, biochemical, and histologic investigations(assessment) of the liver
 - Transaminases and markers of cholestasis
 - Measures of liver function
 - (a) Static: including INR (PT), Factors V and VII, bilirubin, albumin
 - (b) Dynamic: including clearance tests, e.g. ICG, galactose, aminopyrine, lidocaine (MEGX)
 - (c) Indicators of portal hypertension including hepatic venous pressure gradient
 - Indications for liver biopsy
- 8. Imaging of the liver
 - Ultrasound and Doppler, Computerized Tomography (CT) Scans, Magnetic Resonance Imaging (MRI) Scans
 - Nuclear tests: Proton Emission Tomographic (PET) Scans, Liver/Spleen scans, Biliary excretion (e.g. HIDA) scans, RBC scans
- 9. Application of investigations to hepatic surgery

B. Congenital and Acquired Non-neoplastic Liver Disease

1. Paediatric liver diseases, Biliary atresia and Alagille's syndrome
 - (a) Presentation, evaluation and natural history
 - (b) Treatment options and indications for intervention
2. Liver cysts and abscesses
 - a. Solitary liver cysts
 - Presentation, evaluation and natural history
 - Distinguish from cystic neoplasm
 - Treatment options and indications for intervention
 - b. Polycystic liver disease
 - Associated abnormalities
 - Presentation, evaluation and natural history
 - Treatment options and indications for intervention
 - c. Pyogenic and fungal liver abscess
 - Potential bacterial and fungal pathogens and sources

- Presentation, evaluation
 - Treatment and indications for surgical drainage of liver abscess including amoebic abscess
- d. Tuberculous abscess
 - Presentation, evaluation and natural history
 - Treatment options and indications for intervention
- e. Echinococcal liver cyst
 - Life cycle, epidemiology, target organs
 - Presentation, evaluation and natural history
 - Treatment options and indications for intervention
- 3. Liver failure
 - Hepatitis and acute liver failure
 - Causes of acute liver failure
 - Investigation and prognosis
 - Classification systems including MELD and King's College criteria
 - Treatment strategies
 - Role of liver support systems
 - Role of liver transplantation
 -
- 4. Cirrhosis and portal hypertension
 - (a) Causes of cirrhosis, diagnosis and natural history, staging and treatment options (including indications for liver transplantation) for each
 - i. Viral hepatitis B, C, D
 - ii. Alcoholic liver disease
 - iii. Non-alcoholic fatty liver disease and steatohepatitis
 - iv. Autoimmune liver disease
 - v. Primary biliary cirrhosis
 - vi. Primary sclerosing cholangitis
 - vii. Haemochromatosis, Wilson's disease, alpha-1 antitrypsin deficiency
 - viii. Budd–Chiari syndrome
 - (b) Portal hypertension
 - i. Pathophysiology
 - ii. Interpretation of haematologic and biochemical tests and imaging
 - iii. Non-operative treatment options and strategies
 - iv. Portosystemic decompression
 - 1. Indications and sequelae
 - 2. Risks and benefits of TIPS
 - 3. Surgical shunts, types
 - 4. Devascularisation procedures
 - v. Indications for liver transplantation

C. Neoplastic Liver Disease

- a. Benign neoplasms of the liver

- Presentation, investigation, diagnosis, and natural history of haemangioma, hamartoma, adenoma, focal nodular hyperplasia
 - Histology and indications for biopsy
 - Treatment options and indication for ablation or resection
- b. Primary malignancies of the liver
1. Hepatocellular carcinoma (HCC)
 - Aetiology, presentation, investigation, diagnosis, and natural history of HCC
 - Role of screening and staging systems for HCC
 - Treatment options and the risk–benefit ratio for each: resection, transplantation, ablation, chemotherapy with or without embolization, radiation
 2. Cholangiocarcinoma (intrahepatic or peripheral)
 - Diagnosis, investigation and staging
 - Treatment options including palliative procedures
 3. Epithelioidhaemangioendothelioma, lymphoma, sarcoma and other neoplasms
 - Diagnosis, investigation and staging
 - Treatment options
- c. Secondary malignancies of the liver
- ❖ Colorectal primary
 - Pathogenesis, staging of colorectal cancer
 - Investigation and staging
 - Treatment options
 - Indications, and risk–benefit ratio of ablation / resection
 - Neo-adjuvant, downstaging, and adjuvant chemotherapy
 - ❖ Neuroendocrine and other primary
 - Investigation and staging
 - Treatment options
 - Indications, and risk–benefit ratio of ablation / resection
 - Neoadjuvant and adjuvant therapy

D. Liver Surgery

Types of liver resection

- Nomenclature of liver resections (Brisbane system)
- Laparoscopic, laparoscopic-assisted, open laparotomy
- Non-anatomic, segmental, lobectomy, extended lobectomy
- Vascular control: none, Pringle manoeuvre, total vascular isolation
- Vascular resection and reconstruction
- Staged resections
- Combination with ablation

Preoperative assessment and the cumulative risks to the proposed procedure

- Patient comorbid conditions (cardiopulmonary and other)
- Hepatic risk
 - (a) Assessment of liver function, portal hypertension
 - (b) Volumetric assessment of liver remnant
 - (c) Portal vein embolization

Preoperative management

- Prophylaxis against common complications such as DVT, infection
- Neuroendocrine hormonal blockade
- Detailed operative plan based on preoperative imaging

Liver resection

1. Anaesthetic considerations: Agents, coagulation, CVP
2. Blood loss conservation including cell saver and blood product administration
3. Laparoscopic techniques
 - (a) Patient and port placement
 - (b) Hand port
4. Parenchymal transection techniques
 - (a) Relative advantages and disadvantages
 - (b) Normal, fatty, fibrotic and cirrhotic parenchyma
 - (c) Laparoscopic or open
5. Concomitant resection and reconstruction of the (i) Diaphragm (ii) IVC (iii) Portal vein (iv) Bile duct and (v) hepatic artery

Post-operative management

Complications and management, including liver failure

E. Liver Transplantation

- History of Liver Transplantation
- Liver Transplantation in India
- Indications and Contraindications for Liver Transplantation
- Organ Preservation in Liver Transplant
- Anesthetic Management in Liver Transplantation
- Immunology of Liver Transplantation
- Pediatric Liver Transplant
- Liver Transplantation in Acute Liver Failure
- Deceased Donor Liver Transplantation
- Living Related Liver Transplantation
- Complications in Living Donor Liver Transplantation
- Machine perfusion, split liver transplants, reduced size organ transplants, domino transplants

5.5 The Biliary Tract including Gallbladder

A. Anatomy, Embryology, Physiology, Investigations

1. Embryology of the biliary tract
 - Relationship to liver, pancreas and other portal and foregut structures
2. Anatomy of the hepatic duct and biliary plate
 - Segmental anatomy and variants of normal
 - Blood supply and lymphatic drainage
 - Relationship with other portal structures

3. Anatomy of the gallbladder and cystic duct
 - Blood supply and lymphatic drainage
 - Variants of normal and anomalies
4. Anatomy of the bile duct
 - Blood supply, lymphatic drainage and regional lymph nodes
 - Variants of normal and anomalies
 - Relationship with other portal structures and the pancreatic duct
 - Sphincter of Oddi and ampulla of Vater
5. Bile metabolism and biliary physiology
 - Bile-salt dependent and independent bile production
 - Hormonal influences
 - Biliary epithelium and gallbladder function
 - Sphincter of Oddi motility
6. Interpretation of biochemical investigations
7. Imaging
 - Axial and body imaging techniques: U/S, CT scan and MRI scan, including MRCP
 - Endoscopic U/S
 - Direct contrast imaging
 - (a) Percutaneous transhepatic cholangiogram (PTC) and cholecystography
 - (b) Endoscopic retrograde cholangio-pancreatography (ERCP)
 - Endoscopic assessment of ampulla of Vater
 - Nuclear biliary excretion imaging (HIDA scan) – qualitative and quantitative

B. Congenital and Non-neoplastic Biliary Disease

- a. Congenital and paediatric

Choledochal cyst, Caroli's disease, congenital hepatic fibrosis, biliary atresia and Alagille's syndrome

 1. Presentation, classification, evaluation and natural history
 2. Treatment options and indications for intervention
- b. Gallstones
 - 1 Pathogenesis
 - 2 Presentation and investigation of biliary colic, cholecystitis, cholangitis, Mirizzi's syndrome, gallstone ileus
 - 3 Treatment: Percutaneous, laparoscopic and open
 - 4 Cholecystectomy-related biliary injuries
 - (a) Mechanism of injury and classification
 - (b) Associated injuries
 - (c) Management
- c. Benign strictures
 - 1 Primary sclerosing cholangitis (PSC)
 - (a) Aetiology, pathophysiology, natural history and non-operative management
 - (b) Complications and management
 - i. Screening for cholangiocarcinoma

- ii. PTC with biliary drainage (PTBD), ERCP with endobiliary stent
 - iii. Resection
 - iv. Transplantation
- (2) Post-traumatic and idiopathic
 - (a) Mechanism of injury and classification
 - (b) Management options
- d. Intrahepatic stones
 - 1. Pathophysiology, presentation and investigation
 - 2. Common infectious bacteria
 - 3. Surgical options including liver resection and biliary access (Hutson)
 choledochojejunostomy, hepaticojejunostomy with transhepatic stents

C. Neoplastic Biliary Disease

- a. Gallbladder
 - (1) Polyps
 - 1. Presentation, natural history
 - 2. Indications for resection
 - 3. Principles of resection
 - (2) Adenocarcinoma
 - 1. Presentation, staging (including histology) and natural history
 - 2. Investigation
 - 3. Surgical options: Extent and timing of resection
 - 4. Chemo and radiotherapy including neo- and/or adjuvant therapy
 - 5. Palliative care options
- b. Bile duct
 - (1) Adenoma of ampulla of Vater
 - 1. Presentation, natural history, investigation
 - 2. Resection options: Endoscopic, transduodenal resection and reconstruction
 - (2) Adenocarcinoma
 - 1. Location: Hilar (Klatskin), intrapancreatic, ampulla
 - 2. Type: papillary, sclerosing
 - 3. Presentation, investigation and staging, including laparoscopic staging
 - 4. Resection and reconstruction: indications and contraindication
 - 5. Palliative options
 - 1. PTBD or endoscopic stent
 - 2. Surgical bypass

5.6 The Pancreas and Duodenum

A. Anatomy, Embryology, Physiology, Investigations

- Embryology of the pancreas and duodenum
 - (1) Relationship to liver, bile duct and other foregut structures
 - (2) Aetiology of anomalies including pancreas divisum and annular pancreas
- Anatomy of the pancreas

- (1) Spectrum of normal anatomy and variants
- (2) Arterial supply and venous drainage
- (3) Lymphatic drainage and regional lymph nodes.
- (4) Relationship with:
 - Portal structures: duodenum, bile duct, hepatic artery, portal vein, splenic and superior mesenteric veins and their branches
 - Retroperitoneum: IVC and its branches, aorta and SMA and their branches, adrenal gland, kidneys
 - Adjacent organs: stomach, spleen, colon, small intestine
- Anatomy of the pancreatic duct
 - Variants of normal and anomalies
- Anatomy of the duodenum
 - (1) Spectrum of normal anatomy and variants
 - (2) Arterial supply and venous drainage
 - (3) Lymphatic drainage and regional lymph nodes.
 - (4) Relationship with:
 - Portal structures: bile duct, hepatic artery, portal vein, splenic and superior mesenteric veins and their branches
 - Retroperitoneum: IVC and its branches, aorta and SMA and their branches, adrenal gland, kidneys
 - Adjacent organs: pancreas, stomach, spleen, colon, small intestine
- Pancreatic metabolism and physiology
 - (1) Exocrine enzyme physiology
 - (a) Synthesis, excretion and activation (b) Neural and hormonal influences
 - (2) Endocrine metabolism
 - (a) Islet cell function, neuroendocrine hormones
- Duodenal physiology
 - (1) Motility
 - (2) Neuroendocrine (“gut”) hormone physiology
 - (3) Biochemical investigation and interpretation
- Biochemical investigations
 - (1) Markers of pancreatic injury
 - (2) Measures of pancreatic exocrine function
 - (3) Urinary and serum neuroendocrine hormones
- Imaging
 - (1) Axial and body imaging techniques:U/S, CT scan and MRI scan, includingMRCP
 - (2) Endoscopy and endoscopic U/S
 - (3) Direct contrast imaging: Endoscopic retrograde cholangio-pancraetography (ERCP)
 - (4) Nuclear studies:
 - PET scan
 - Neuroendocrine imaging (Octreotide scan)
 - (5) Application of investigationsand imaging to pancreatic and duodenal surgery

B. Congenital and Acquired Non-neoplastic Pancreatic Disease

1. Pancreatitis
 - (1) Acute
 1. Pathogenesis, staging and prognosis
 2. Management, including surgical options and complications
 3. Indications for surgical intervention
 - (2) Chronic
 1. Pathogenesis, complications and nonoperative management
 2. Pancreatic stents and endoscopic/percutaneous drainage procedures
 3. Surgical options and indications
 4. Pain control
2. Pancreas Divisum
 - (1) Pathogenesis, staging and prognosis
 - (2) Management, including surgical options and complications
 - (3) Indications for surgical intervention
3. Annular Pancreas
 - (1) Pathogenesis, staging and prognosis
 - (2) Management, including surgical options and complications
 - (3) Indications for surgical intervention

C. Neoplastic Diseases

1. Benign cysts and neoplasms of the pancreas
 - (1) Microcystic serous cystadenoma
 - (a) Presentation, investigation, diagnosis, and natural history
 - (b) Histology and indications for biopsy
 - (c) Treatment options and indication for resection
 - (2) Mucinous cystic neoplasm
 - (a) Presentation, investigation, diagnosis, and natural history
 - (b) Histology and indications for aspiration/biopsy
 - (c) Treatment options and indication for resection
 - (3) Intraductal papillary mucinous neoplasm (IPMN)
 - (a) Presentation, investigation, diagnosis, and natural history
 - (b) Histology and indications for aspiration / biopsy
 - (c) Treatment options and indication for resection
 - (4) Solid pseudopapillary neoplasms
 - (a) Presentation, investigation, diagnosis, and natural history
 - (b) Histology and indications for aspiration / biopsy
 - (c) Treatment options and indication for resection
 - (5) Cystic neuroendocrine tumours
 - (a) Presentation, investigation, diagnosis, and natural history
 - (b) Histology and indications for aspiration / biopsy
 - (c) Treatment options and indication for resection
 - (6) Von Hippel Lindau syndrome
 - (a) Pathology, associated lesions, investigation
 - (b) Management
2. Malignancies of the pancreas
 - (A) Primary**
 - (1) Adenocarcinoma

- a) Presentation, investigation and staging
- b) Assessment of resectability
- c) Pre-, peri- and postoperative management
- d) Palliative procedures
- (2) Neuroendocrine tumours
 - a) Presentation, investigation and staging
 - b) Assessment of resectability
 - c) Pre-, peri- and post-operative management
- (3) Lymphoma
 - a) Presentation, staging
 - b) Role of surgery
- (B) Secondary**
 - (a) Renal cell carcinoma: Presentation and management
 - (b) Melanoma: Presentation and management

D. Diseases of the Duodenum

1. Congenital disorders of the duodenum
 - (1) Duodenal atresia and duplication
 - (2) Duodenal diverticulae
2. Duodenal ulcer disease
 - (1) Pathogenesis, investigation and diagnosis
 - (2) Nonoperative treatment
 - (3) Operative management
3. Benign neoplasms
 - (1) Adenoma
 - (2) Hereditary Familial Polyposis: Genetics, presentation, investigation and management
4. Malignant neoplasms of the duodenum
 - (1) Adenocarcinoma: Presentation, investigation, staging and management
 - (2) Gastrointestinal stromal tumour (GIST) and sarcomas: Presentation, investigation, staging and management
 - (3) Neuroendocrine tumour: Presentation, investigation, staging and management
 - (4) “Secondary” to direct invasion of adjacent malignancy
 - Carcinoma of the stomach or colon
 - Renal cell carcinoma
 - Investigation, staging
 - Operative management

5.7 Peritoneum

- Omentum, Retroperitoneum Recesses, reflections, subdiaphragmatic spaces, peritonitis
- Primary secondary and tertiary, tuberculosis, mesenteric cyst, pseudomyxoma peritonei, ascites (diagnosis, investigation and management), retroperitoneal tumors, inguinal hernia, ventral hernias, peritoneoscopy

5.8 Spleen

- Anatomy, splenic function, haemolytic anaemias, splenomegaly, hypersplenism, splenic trauma, cysts and granulomas, physiological effects of splenectomy, OPSI, splenic vein thrombosis, splenic artery aneurysms, splenectomy, splenic preservation.

5.9 Small Intestine

- Mesenteric vascular anatomy, intestinal physiology, Ladd's band, malrotation, volvulus, hernia, intestinal obstruction, ileocaecal TB, lymphoma, Benign and malignant tumors of small intestine
- Meckel's diverticulum, intussusception, small bowel gangrene, intestinal resections, lengthening and transplantation, acute and chronic mesenteric ischaemia, short gut syndrome, small bowel fistulae
- Crohn's and other inflammatory bowel diseases enteral feeding, home/parenteral nutrition.

5.10 Colon, Rectum and Anal Canal

- Anatomy, physiology, colonic motility, physiology of defecation and anal continence; Hirschsprung's disease, anorectal malformations, rectal prolapse, SRUS, pseudo-obstruction (Ogilvie syndrome), descending perineum syndrome, anismus and constipation, anal incontinence
- Haemorrhoids, fissure, fistulae and anal stricture; polyps and other benign tumors hereditary and familial polyposis syndrome, ulcerative colitis and Crohn's amoebic colitis, ischemic colitis, diverticulitis, lower GI hemorrhage, carcinoma of the colon, rectum, anal canal
- Operations: Abdominoperineal, low and ultra-low anterior resection, segmental colectomies, pelvic exenterations, colostomy, ureterosigmoidostomy, hemicolectomies, urinary diversions, surgery for anal incontinence, rectal prolapse and complex fistulae, restorative proctocolectomy and ileoanal pouch anastomosis

5.11 Imaging

- The applied physics and technology of Ultrasound and Doppler, CT Scan, MRI Scan, PET Scan and the other nuclear medicine imaging procedures
- The clinical protocols available for each technology
- (1) The information provided by each protocol
- (2) The interpretation of images
- (3) The application to clinical investigation
- Imaging algorithm for the investigation of luminal, hepato-biliary and pancreatic lesions:

5.12 Oncology

1. Basic pathophysiology of neoplasia
 - (1) Mechanisms of carcinogenesis
 - (2) Genetic alterations
 - (3) Viral carcinogenesis
 - (4) Chronic inflammation
 - (5) Tumour biology including the potential for metastases
2. Chemotherapy
 - (1) Classes of drugs
 - (2) Mechanisms of action
 - (3) Toxicities
 - (4) Combination therapy and available protocols
3. Radiation therapy
 - (1) Applied physics and technology
 - (2) Mechanism of action
 - (3) Toxicity
 - (4) Combination protocols with chemotherapy
4. Multidisciplinary management: Relative roles of surgery, ablation, chemotherapy and radiation therapy as:
 - (a) Definitive management
 - (b) Neo- and adjuvant therapy
 - (c) Therapy for recurrent disease
5. Palliative therapy

5.13 Trauma

1. Liver trauma
 - (1) Mechanisms of injury and presentation
 - (2) Diagnosis and classification of liver lacerations
 - (3) Management
 - Angiography and embolization
 - Liver parenchyma haemostasis techniques
 - Total vascular exclusion with or without IVC shunt or veno-venous bypass for retrohepatic IVC and/or hepatic vein injuries
 - Resection
 - (4) Complications: diagnosis and management
2. Biliary tract and portal structures
 - (1) Mechanisms of injury and presentation
 1. “External” trauma
 2. Operative injury during cholecystectomy
 - (2) Investigation, diagnosis and classification of bile duct injuries: Identification of associated injuries
 - (3) Management
 - (a) Timing and role of ERCP + stent and PTBD
 - (b) Principles and techniques of biliary reconstruction
 - (4) Complications: diagnosis and management
3. Pancreatic and duodenal trauma
 - (1) Mechanisms of injury and presentation

- (2) Investigation, diagnosis
- (a) Identification of pancreatic duct disruption
 - (b) Identification of duodenal injury
- (3) Management
- (a) Indications for pancreatic resection
 - (b) Techniques for repair of duodenal injuries
- (4) Complications: diagnosis and management

5.14 Transplantation

- a. Organ procurement
 - Brain death and donor management
 - Deceased donor hepatectomy and pancreatectomy
 - Living donor assessment
 - (a) Living donor left or right hepatectomy
 - Organ preservation: Principles and application
- b. Transplantation
 - (1) Indications for liver transplantation
 - (a) Acute and chronic liver failure
 - (b) Hepatocellular carcinoma and other liver tumours
 - (c) Childs' and MELD scores and organ allocation
 - (2) Liver
 - (a) Transplant hepatectomy
 - (b) Liver transplant techniques
 - (3) Pancreas
 - (a) Back bench reconstruction
 - (b) Pancreas transplant
 - (4) Immunosuppression: Drugs, mechanisms of action, toxicities and combination therapy
 - (5) Complications of transplantation (a) Surgical (b) Infectious (c) Immunologic

5.15 Miscellaneous

- Variceal Upper Gastrointestinal Bleeding Management of Nonvariceal Hemorrhage
- Approach to the Management of Lower Gastrointestinal Hemorrhage
- Bariatric and Metabolic Surgery
- Robotics in Gastrointestinal Surgery
- Tumor Markers in Gastrointestinal Malignancy Chylous Ascites
- Acute Postoperative Pain and its Management in Major Abdominal Surgeries
- Telemedicine: Principles and the Surgery for Portal Hypertension
- System based approach and
- Role of Disease Management Groups (DMG) or Multi-Disciplinary Teams (MDT) for GI Oncology and Chronic GI disorders

5.16 General

1. Approach to a Patient of Digestive Disease
2. Gastrointestinal Imaging

3. Infections and Antibiotics in Gastrointestinal Surgery, Response Syndrome (SIRS), multiple organ dysfunction syndrome (MODS), immunology in relation to transplantation and rejection, intensive care and respiratory support
4. Nuclear Medicine Imaging in Gastrointestinal Diseases and GI Oncology
5. Radiation Therapy
6. Minimal Access Surgery in GI Surgery and GI Oncology
7. Chemotherapy Principles and Techniques for Gastrointestinal Cancers
8. Nutritional Support to Hospitalized Patients, Surgical nutrition- parenteral and enteral, iatrogenic complications of surgery like enterocutaneous fistulae, biliary strictures, intrabdominal sepsis/collections, AIDS, hepatitis and surgeons, renal failure, shock, disorders of coagulation, Surgery for morbid obesity
9. Research Methodology, Data Science Management and Statistics for Surgeons
10. Interventional Radiology of the Gastrointestinal Tract and Hepatobiliary System
11. Tumour genetics- oncogenes, tumor markers, Systemic Inflammatory
12. Biostatistics, Data management, Research Methodology and Clinical Epidemiology
13. Ethics
14. Medico legal aspects relevant to the discipline
15. Health Policy issues as may be applicable to the discipline

6. TEACHING AND LEARNING PROGRAM

Teaching programs will need to be held on all working days. (at least one hour per day)

Activities
Journal Club
Didactic lectures
Seminars/ Webinars
Hospital (Grand Rounds/Clinical meeting/Audit meet)
Clinical Case Presentation/ presentation to multidisciplinary tumour boards

6.1 TEACHING AND LEARNING METHODS

Post graduate teaching programme

Teaching methodology

General principles

Acquisition of practical competencies being the keystone of post graduate medical education, PG training should be skills oriented. Learning in PG program should be essentially self-directed and primarily emanating from clinical and academic work. The formal sessions are merely meant to supplement this core effort.

Teaching Methodology

The post graduate student should be given the responsibility of managing and caring for patients in a gradual manner under supervision.

Formal teaching sessions

This should include regular bedside case presentations and demonstrations, didactic lectures, seminars/Webinars, journal clubs, clinical meetings, and combined conferences with allied departments, Audit meet, clinical case presentation etc. as per sample schedule given below:

Didactic Lectures

In addition, 10 lectures per year covering recent advances in all aspects of gastrointestinal diseases with particular emphasis on their surgical and medical management would be taken by faculty. All post graduate students will be required to attend these lectures. The students are also required to attend short term basic and clinical courses on:

- Bio-statistics,
 - Research methodology,
 - Laboratory medicine techniques/courses relevant to management of gastrointestinal diseases,
 - Use of computers/ data science management in medicine,
 - Bioethics, ethical issues involved in management of gastrointestinal diseases
 - hospital waste management,
 - health economics.
- In addition, student should attend accredited scientific meetings (CME, symposia, and conferences) once or twice a year.

6.1. The M.Ch. Surgical Gastroenterology training will include two main arms:

- 6.1.1. Formal training and learning
- 6.1.2. Experiential learning

6.1.1. Formal training and learning will include:

1. Clinical GI &HPB surgery (including history taking, physical examination, diagnosis, selection and planning of investigations and management).
2. Essentials of gastroenterology.
3. Basic medical science applicable to GI &HPB surgery.

4. Principles and interpretation of relevant investigations.
5. Performance of common GI &HPB operations.
6. Knowledge of history and recent advances in GI &HPB surgery.
7. Preparation of scientific papers for publication and presentation in conferences, statistics and research methodology.
8. Familiarity with the principles and practice of Evidence Based Medicine.
9. Behavioral and ethical skills training.

The modalities for formal training will be as follows:

1. **Seminars/ Webinars:**To be held once a week and presented by the trainee under supervision of teaching faculty.
2. **Journal Clubs:**To be held once a week under supervision of teaching faculty. It should include discussion on recent articles, which relate to various topics in HPB surgery.
3. **Treatment Planning Sessions:** The trainee is to discuss the planning of a given patient who is being worked up for surgery. The idea of this academic exercise is to familiarize the trainee with the objectives of planning in a given patient through a group discussion/ multidisciplinary tumour boards based on evidence-based medicine.
4. **Clinical grand rounds:**A clinical grand round, involving presentation of unusual and difficult cases, to be done by a resident, once a week, in the presence of all the clinical staff belonging to the department of Surgical Gastroenterology. The exercise is to develop the clinical acumen of the trainee.
5. **Teaching and training responsibilities (Pedagogy skills):** A final year M.Ch. trainee should be entrusted with the responsibilities of teaching post-graduate students of General Surgery and Surgical gastroenterology.
6. **Attending CME (Mandatory):** The trainee must attend one accredited national CME/conference of GI &HPB surgery per year, during the second and third year of the training period.
7. **Research Publication (Research skills):** The trainee is to be encouraged to publish clinical or original research material in scientific journals. This is to be done under the direct supervision of the supervisor or his associate(s). Through this exercise the trainee would learn how to collect and analyze data, make observations in a scientific manner, and use appropriate statistical methodology. The trainee would learn the art of putting the outcome of observations and results in an appropriate format of a scientific paper that is relevant to a particular journal.
8. **Training in research methodology:**All M.Ch. trainees must complete research projects as per requirement of concerned universities, under the supervision of a principal supervisor and appropriate number of co-supervisors which would enable the

trainee to attain proficiency in collecting clinical / experimental data and analyze them in a scientific way using appropriate statistical methods. The purpose of the exercise is imparting proficiency to the trainee in research methodology. This would be a mandatory component of training.

9. **Lecture/discussion:** Lectures on newer topics by faculty, in place of seminar, as per need.
10. **Case presentation:** Post graduate students will present a clinical case for discussion before a faculty and discuss the management.
11. **Radiology conference** should be held once a week in which the radiological features of various cases are discussed.
12. **Surgico-pathological conference:** Special emphasis is made on the surgical pathology and the radiological aspect of the case in the Pathology department.
13. Training / experience in Liver Transplant Programme

Each PG student is expected to be conversant with the Departmental protocols (viz. recipient selection and workup, pre-transplant evaluation, Indian brain death law, brain dead donor management - before and during retrieval, donor harvesting procedures, recipient management - operative and post-transplant care and follow up).

14. Departments of Surgical Gastroenterology should have facility for organ transplantation. However in the transition period, if department does not have such facility, trainee must be posted to a transplant centre for a period of 3 months.

6.1.2. Experiential learning

The training should consist of a programme that provides learning experience to the trainees by being posted in routine and emergency wards, outpatient departments (OPD), and operation theatres (OT). The following are the various areas of patient care and management during the M.Ch. training period:

1. **Emergency postings:** All these are done under direct supervision. The clinical acumen of the trainees and their ability and promptness to deal with emergencies is well developed during this posting. These would include:
 - a. Resuscitation of emergency patients.
 - b. Initial assessment and prioritization of the problems.
 - c. Planning appropriate investigations.
 - d. Initiating treatment as per management plan.
 - e. Liaising with ancillary departments for planning further work up and/or management

2. **Routine postings:** In this posting, the candidate is posted in various subunits of the Department of Surgical Gastroenterology in the form of regular postings, namely main Surgical Gastroenterology ward, Surgical Gastroenterology operation theatre, routine Surgical Gastroenterology OPD.
3. **Clinical Postings:** In addition to posting to ward, OPD, operation theatre, emergency and investigative facilities of GI & HPB Surgery, it is desirable to rotate the trainees to various allied/ancillary disciplines including medical gastroenterology, hepatology, interventional radiology, pathology, etc.
4. **Administrative experience:** The senior-most trainee should be entrusted with administrative responsibilities including academic programme, patient management, functioning of the ward and outpatient department. These may include:
 1. Admission of patients.
 2. Preparing the operation theatre lists.
 3. Improving the functioning in the ward through the supervisor.
 4. Preparing list of topics for teaching of junior trainees posted in the department.
 5. Organizing the posting of trainees in various work stations of the department as per the demand of the situation

5. Log Book

The trainees must maintain a log book of the work carried out by them and the training program undergone during the period of training including details of surgical operations assisted or done independently. The log book should be checked and assessed periodically by the faculty members imparting the training.

During the training programme, patient safety is of paramount importance; therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently. For this purpose, provision of skills laboratories in medical colleges is mandatory.

7. ASSESSMENT

A. FORMATIVE ASSESSMENT during the training includes:

General Principles

Assessment

- | | |
|-----------------------------------|---------------------------------------|
| • Personal attributes | Ongoing after each clinical posting |
| • Clinical skills and performance | -do- |
| • Academic activities | -do- |
| • Theory assessment | End of 1-, 2- and at 2 years 9 months |
| • Practical assessment | -do- |

Clinical skills and performance, academic performance and personal attributes shall be graded on a scale of 1 to 5 (5 being the highest). The academic presentations shall be graded at the time of presentation by the consultant in-charge. Evaluation on clinical skills and personal attributes others shall be done by the unit/department in-charge at the end of every semester. The student to be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I).

B. Summative assessment:

The M.Ch. examination shall be in two parts:

1. **Theory:** There shall be four theory papers as follows:

Paper I: Basic Sciences as applied to Surgical Gastroenterology

Paper II: Clinical and operative Surgical Gastroenterology

Paper III: Surgical Gastroenterology including Transplantation and Minimal access.

Paper IV: Recent advances in Surgical Gastroenterology

The theory examination shall be held in advance before the clinical and practical examination, so that the answer books can be assessed and evaluated before the commencement of the clinical/practical/oral examination. The post graduate students for M.Ch in Surgical Gastroenterology will be examined also in surgical procedures.

2. **Practical:** The practical examination should consist of the following and should be spread over two days, if the number of candidates appearing is more than one.
 1. Four cases from various sections of Surgical Gastroenterology: History taking, physical examination, interpretation of clinical findings, differential diagnosis, investigations, prognosis and management.
 2. Ward rounds comprising of discussion of practical problems in the management of patients undergoing Surgical Gastroenterology.
 3. Viva-voce examination
 - Instruments
 - Radiology
 - Surgical Pathology
 - Videos
 - Logbook

3. Theory and Practical examination will be conducted as per University guidelines.

Other recommendations:

1. Systematic and periodic formative assessment should be done every 6 months and feedback should be given to trainee.

RECOMMENDED TEXT BOOKS AND JOURNALS

A. BOOKS (latest edition)

- Blumgart L.H. : Surgery of the Liver, Pancreas and Biliary Tract
- Bockus H.L. : Gastroenterology
- Cotton and Williams : Practical Gastroenterological Endoscopy
- Cuschieri and Berci : Laparoscopic Biliary Surgery
- DeVita, Lawrence, and Rosenberg's Cancer: Principles and Practices of Oncology
- Goligher J.C.: Surgery of the Anus, Rectum and Colon
- Haribhakti S Surgical Gastroenterology 3rd Edition.
- Keighley M.R.B.: Surgery of the Anus, Rectum and Colon
- Maingot's Abdominal Operations
- Michael Trede : Surgery of the Pancreas
- Mishra PK Textbook of Surgical Gastroenterology (2 Volumes)
- Nyhus, Baker and Fischer : Mastery of Surgery
- Rob and Smith's Operative Surgery
- Sabiston Textbook of Surgery- The Biological Basis of Modern Surgical Practice
- Sherlock and Dooley: Diseases of the Liver and Biliary System
- Zuidema and Shackelford :Shackelford's Surgery of the Alimentary Tract

B. JOURNALS

- Alimentary Pharmacology and Therapeutics
- American Journal of Gastroenterology
- Annals of Surgery
- BMC Surgery
- British Journal of Surgery
- Clinical Gastroenterology and Hepatology

- Current Problems in Surgery
- Current Opinion in Gastroenterology
- Digestive Surgery
- Disease of Oesophagus
- Diseases of Colon and Rectum
- Gastroenterology
- GI Surgery Annual
- Gut
- Hepatology
- JAMA Surgery
- Lancet
- Liver Transplantation
- New England Journal of Medicine
- Recent Advances in Surgery: UK and Indian Editions
- Surgery Today
- Transplantation
- Tropical Gastroenterology
- Journal of Gastrointestinal Surgery

C. WEB RESOURCES: These could include UpToDate, Clinical Keys, etc.

Annexure I
Postgraduate Students Appraisal Form
Clinical Disciplines

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM.....TO.....

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1.	Journal based / recent advances learning				
2.	Patient based /Laboratory or Skill based learning				
3.	Self directed learning and teaching				
4.	Departmental and interdepartmental learning activity				
5.	External and Outreach Activities / CMEs				
6.	Thesis / Research work				
7.	Log Book Maintenance				

Publications

Yes/ No

Remarks* _____

***REMARKS:** Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.

SIGNATURE OF ASSESSEE

SIGNATURE OF CONSULTANT

SIGNATURE OF HOD

**NATIONAL MEDICAL COMMISSION
Postgraduate Medical Education Board**

D 11011/1/21/AC/Guidelines 07

Date: 08-10-2021

**GUIDELINES FOR COMPETENCY
BASED
POSTGRADUATE TRAINING
PROGRAMME FOR M.Ch. IN
PEDIATRIC SURGERY**

GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR M.Ch. IN PEDIATRIC SURGERY

1. PREAMBLE

The aims and objectives of M.Ch. training should be to train candidates with knowledge in surgical sciences and an aptitude to care for neonates and children with specific knowledge, skills and attitudes in the specialty of Pediatric Surgery. The training should help him/her to function as a safe Pediatric surgeon, an independent clinical consultant, a medical teacher and conduct research studies.

2. SUBJECT SPECIFIC OBJECTIVES

The aim of course is to produce Pediatric surgeons who are capable of setting a standard and demonstrate commensurate expertise in the field. The training should aim to facilitate the candidate's acquisition of a judicious mix of the three domains of learning that will be practiced ethically-

- Cognitive (knowledge),
- Psychomotor (practice) and
- Affective (communication).

2.1 Cognitive domain (Knowledge)

- Understand the basic sciences (embryology, anatomy, physiology, biochemistry, pharmaco-therapeutics etc.) and principle of pediatric medical care as applicable to pediatric surgical practice.
- Be conversant with the embryology, etiology, pathophysiology, diagnosis and management of common neonatal and pediatric surgical problems - elective or emergency.
- **Group approach:** Recognize the role of multidisciplinary and interdisciplinary approach in the management of various pediatric surgical disorders so as to obtain relevant specialist consultation, where appropriate.
- **Research Methodology:** Basic knowledge of research methodology and bio-statistics; familiarity and participation in clinical and experimental research studies; involvement in scientific presentation and publication.

- Recognize the importance of family, society and socio-cultural environment in the treatment of the sick child.

2.2 Psychomotor domain(Practical)

- Evaluate a patient thoroughly (history, clinical examination), order relevant investigations and interpret them to reach a diagnosis and plan of management.
- Plan and carry out simple investigations/ procedures (bedside, laboratory, radiology suite) independently.
- Provide Basic and Advanced Life Support services in emergencies e.g. NALS, PALS.
- Acquire familiarity with and provide critical care of surgical neonates and infants - airway support, ventilation, central vascular access etc.
- Prepare a patient for an elective/emergency surgery and provide specific post-operative care.
- Provide counseling to the patient and primary caretakers for the smooth dispensation of medical care.
- Acquire skills in routine ward procedures (e.g. bladder catheterization, wound dressings, peripheral vascular access, child restraint etc.).
- Acquire proficiency in prescribed minor and major operative procedures, and provide these, initially with assistance and later independently.
- Monitor the post-operative patient in the routine post-op ward / high dependency unit / and in the intensive care setting.
- Provide specific and relevant advice to the patient and family at discharge time for proper domiciliary care, hospital reporting in emergency and routine follow up.

2.3 Affective domain(Communication)

- Develop and practice effective communication skills.
- Professionally interact and obtain relevant specialist/ancillary services' consultation where appropriate.
- While teaching others in a clinical care unit, ensure team work and establish a pediatric surgical unit.
- Establish effective communication with the caregivers of the patient including counseling and terminal care.

- **Medical Ethics and Human values:** The student will inculcate ethical principles in all aspects of pediatric surgical practice/research (professional honesty and integrity, humility, moderation, informed consent, counseling, awareness of patients' rights and privileges, etc.).

3. SUBJECT SPECIFIC COMPETENCIES

3.1 COGNITIVE (KNOWLEDGE) DOMAIN

3.1.1 Competencies to be acquired in the cognitive domain (knowledge)

a. History and Physical

- Establish rapport with child and parent/guardian who has complete knowledge of the child and obtain comprehensive history,
- Perform a complete physical examination of relevant systems based on history,
- Should have knowledge of systemic examination in a child,
- Summarize history and physical examination results to arrive at a provisional diagnosis with other differential diagnosis in order of possibility and communicate the same to the team members.

b. Evaluation and Management

- List out and order appropriate investigations towards arriving at a final diagnosis or narrowing the list of differential diagnosis. Prioritize emergency and routine investigations,
- Should know to interpret the results of the investigations ordered, including acceptable normal variations and confirm a working diagnosis,
- Plan management based on the final diagnosis arrived at,
- Communicate effectively the diagnosis, plan of management and possible outcomes to the parents/ caretakers,
- Communicate clearly the investigation results, plan of management to the team justifying the same,
- Should be able to recognise abnormal results and reports and prioritise those requiring immediate response,
- Train and mentor junior team members.

c. Documentation

- Should be able to systematically document case history, examination findings, summarize management plan based on investigations and clinical examination,
- Uses the electronic record when available to keep the team informed of progress,

- Flow chart of management with orders which are clear and understandable by juniors,
- Should be able to write appropriate cross departmental referrals,
- Should be able to write lucid discharge summaries chronicling the admission, evaluation, management and post-operative course in the hospital with clear instructions regarding medications on discharge and follow up.

d. Communication

- Communicates the diagnosis, plan of management clearly to parents/guardians,
- Communicates orally and by documentation to junior healthcare workers the treatment plan,
- Communicates appropriately while handing over to maintain uninterrupted care of patient,
- Obtain informed consent for surgery and procedures after explaining alternatives to the parents,

e. Team work.

- Should work as an active member of the professional team
- Should accept responsibilities and carry them out effectively
- Should ask for help from team members when needed and should be willing to help when asked for
- Should be actively involved in patient care and follow up

f. Others.

- Have empathy for patients and parents/guardians,
- Incorporates all the four pillars of medical ethics and practise them diligently,
- Recognizes medico-legal issues, patient confidentiality and other regulations pertaining to medical practice,
- Conceptualises and carries out research incorporating the principles of Good Clinical practices,
- Teach relevant aspects of Pediatric surgery to resident doctors, junior colleagues, nursing, and para-medical staff,
- Understand factors for hospital infection and take appropriate universal precautions to prevent hospital infection,
- Should be well versed in the administrative functioning of the department and the ward including the staffing requirements, procurement and maintenance of electro-medical equipment,

3.1.2 Competencies to be acquired in basic sciences applicable to Pediatric Surgery:

- a) Genetic basis of disease
- b) Molecular biology applicable to congenital anomalies
- c) Fetus as a patient
 - Antenatal diagnostic tools
 - Antenatal prognosticators
 - Fetal interventions
- d) Normal and anomalous embryogenesis of all systems:
 - Gastrointestinal tract
 - Hepatobiliary and pancreas
 - Respiratory system including diaphragm and related Cardiovascular system
 - Genito-urinary tract, including descent of testes, sexual differentiation.
 - Lymphatic system
 - Face and neck including lip, palate, branchial and thyroglossal apparatus
 - Abdominal wall, umbilicus and inguinal canal
 - Central nervous system and spine
- e) Surgical anatomy of all above mentioned systems
- f) Physiology and biochemistry
 - Physiology of fetus and newborn including transition from former to latter
 - Gastrointestinal physiology including deglutition, esophageal motility, antireflux mechanism, intestinal motility & defecation and neuroenteric regulation
 - Altered biochemistry in intestinal obstruction
 - Hepatic function including bilirubin metabolism.
 - Physiology of micturition and neurogenic regulation of same
 - Biochemical changes in obstructive uropathy and renal failure.
 - Cardiovascular physiology including fetal & neonatal cardiac function
 - Pulmonary physiology and basis of mechanical ventilation
 - Fluid and electrolyte balance.
 - Hemolytic disorders
 - Nutritional requirements in health and disease including parenteral nutrition.
 - Sexual differentiation including biochemical aspects in anomalous conditions.
 - Physiological changes during pre-operative and post-operative period and changes during different types of anesthesia and laparoscopic surgery

g) Microbiological principles governing:

- Pathophysiology of sepsis in neonates, infants and children, and inflammatory response,
- Maintenance of asepsis, sterility in newborn nursery, ward and operation theatre,
- Sterilization of surgical instruments including endoscopes & ventilators,
- Common surgical infections, including osteomyelitis and septic arthritis,
- Surgical tuberculosis including atypical mycobacterial infection,
- AIDS/HIV in Pediatric Surgery,
- Parasitic surgical conditions,
- Elements of immunology including its importance in organ transplantation & immunosuppression,
- Immunization and vaccination.

3.1.3 Competencies to be acquired in general patient care applicable to Pediatric Surgery

- Basic and Advanced life support in Neonates and Pediatrics
- Basics of mechanical ventilation, different types of ventilatory support
- Different types of venous access, arterial access - monitoring
- Principles and types of physiological monitoring
- Transport and restraint of the sick child

3.1.4. Trauma

A. General principles of trauma

Upon completion of this, the trainee should be able to describe & discuss:

- Epidemiology of Pediatric trauma
- Different types of trauma, presentation
- Acute care of trauma patients including immediate assessment, triaging, evaluation tools to be used, scoring systems and prognostications

B. Systemic trauma

Upon completion of this, the trainee should be able to describe & discuss the different types of trauma pertaining to, their management, indications for surgery, outcomes of :

- Head injury
- Thoracic injuries including airway, chest wall and mediastinum
- Abdominal injuries including blunt and penetrating, solid and hollow viscera, retroperitoneum

- Genitourinary trauma including kidney, ureter, bladder, urethra and genital organs
- Musculoskeletal and spine trauma
- Burns
- Child abuse
- Soft tissue and envenomation

3.1. 5 Pediatric Oncology

A. General principles

Upon completion of this, the trainee should be able to describe & discuss:

- Genetic basis of tumours
- Tumour markers
- Principles and application of chemotherapy including toxicities of routinely used chemotherapeutic drugs
- Principles and application of radiotherapy including toxicities of routinely used radiotherapy
- Immuno-therapy
- Gene therapy and newer modalities of treatment
- Various evaluation modalities in Oncology

B. Systemic oncology

Upon completion of this, the trainee should be able to describe & discuss in detail the presentations, staging, prognostication, various treatment systems applicable to specific tumours:

- Wilms' tumour
- Neuroblastoma
- Liver tumours
- Rhabdomyosarcomas
- Germcell - tumours

Upon completion of this, the trainee should be able to describe & discuss an outline of the presentation and management of the following tumours:

- Common lymphomas and leukemias
- Common bone tumours
- Central nervous system tumours

3.1.6 Evaluation methods in Pediatric Surgery

A. Radiology

Upon completion of this, the trainee should be able to describe & discuss the principles of, applications, pitfalls, modifications in specific situations, how to carryout various investigations and interpret:

1. X rays
2. Ultrasonography including Doppler
3. CT scan
4. Voiding Cystourethrography
5. Contrast upper and lower GI series
6. Intravenous pyelography
7. MRI
8. PET - CT scan

B. Nuclear Medicine

Upon completion of this, the trainee should be able to describe & discuss the principles of, applications, pitfalls, modifications in specific situations, how to carryout various investigations and interpret:

1. Renal Dynamic Diuretic Radionuclide scintigraphy with various isotopes like EC, MAG3, DTPA
2. Static Cortical renogram - DMSA
3. Direct Radionuclide Cystography (DRCG)
4. Hepatobiliary scintigraphy
5. MIBG scan
6. Lymphatic scintigraphy
7. Thyroid scintigraphy
8. Gastro-esophageal reflux scintigraphy
9. RBC blood pool scan
10. Technitium Meckel's scan
11. PET scan
12. Liver-Spleen scan
13. Bone scan

C. Urodynamics

Upon completion of this, the trainee should be able to describe & discuss the principles of, applications, pitfalls, modifications in specific situations, how to carryout various investigations and interpret:

1. Uroflowmetry

2. Cystometrogram
3. Video urodynamics

D. Others

Upon completion of this, the trainee should be able to describe & discuss the principles of, applications, pitfalls, modifications in specific situations, how to carry out various investigations and interpret:

1. 24 hour pH monitoring
2. Esophageal and anorectal manometry
3. Intracranial pressure monitoring
4. Basics of pathological biopsies, examination including frozen section immunohistochemistry

3.1.7 Transplantation

Upon completion of this, the trainee should be able to describe & discuss:

1. Principles of transplantation including immunology and selection of recipients
2. Organ procurement and preservation
3. Outcomes including complications of transplantation
4. Immuno-suppression and its toxicities
5. Indications, preparation of recipient, techniques and post transplantation management and outcomes of the following:
 - a. Kidney transplantation and liver transplantation in detail
 - b. An outline of pancreatic transplantation, intestinal transplantation, bone marrow transplantation, heart & heart-lung transplantation

3.1.8 Regional and Special Pediatric Surgery

At the end of the training, the student should be able to describe, discuss, analyse and present pathogenesis, clinical presentations, differential diagnosis, diagnostic approach, roles of specific diagnostic tools, interpretation of the test results, management options (both non-operative and surgical), indications for surgery, preparation for surgery, peri- and post-operative management, surgical steps, complications and their management, outcomes (short and long - term) of the various congenital and acquired pathologies in each system as below (elaborated in detailed in the syllabus sections):

- A: Head and Neck:
B: Thorax:

- C: Abdomen:
- D: Genitourinary Tract
- E. Special Pediatric Surgery

3.1.9 Recent Advances

Upon completion of this, the trainee should be able to describe & discuss the advanced technology, its applications in diagnosis and treatment, complication and research options related to the fields outlined above. In addition, he must be conversant with:

- Minimal Access surgery of all areas including laparoscopy, thoracoscopy, ventriculoscopy, STEALTH and endoscopic surgeries, gastrointestinal endoscopy including ERCP (endoscopic retrograde cholangio-pancreatography), Bronchoscopy and Endourology.
- Robotics in Pediatric Surgery
- Use of newer energy sources in surgery including LASER, harmonic scalpel etc.
- Use of various types of staplers: Intestinal, Vascular, Endo GI etc.

3.2 AFFECTIVE DOMAIN (ATTITUDES AND VALUES)

The post graduate student should imbibe the following:

- **Group /Team approach:** function as a part of a team, co-operate with colleagues, and interact with the patient to provide the optimal medical care.
- **Ethical practice:** Abide by ethical principles in medical practice, maintain proper etiquette in dealings with patients, caretakers and other health personnel including due attention to the patient's right to information, consent and second opinion. Maintain professional integrity while dealing with patients, colleagues, seniors, pharmaceutical companies and equipment manufacturers.
- **Skills:** Preparation of oral presentation, medical documents, professional opinion in interaction with patients, caretakers, peers and paramedical staff – both for clinical care and medical teaching. Effective communication with the patient/caretakers regarding the nature and extent of disease, treatment options available and realistic outcome following optimal management is essential.

- During the course of three years the post graduate student is expected to attend instructive courses that facilitate proficiency relevant to this domain, eg., communication skills, biomedical ethics, patient counseling etc.

3.3 PSYCHOMOTOR DOMAIN (SKILLS)

The trainee pursuing MCh. in Pediatric Surgery course must acquire the following evaluations and skills - procedural and non-procedural skills - in the management of surgical diseases of children -

3.3.1. Clinical examination, outpatient and inpatient evaluation

Upon completion of the course, the post graduate student should be able to perform the following:

- Assess the child patient with surgical problems by:
 - Eliciting pertinent history.
 - Performing correct physical examination.
 - Making a working diagnosis.
 - Determining the type of care that is appropriate – outpatient/ inpatient /daycare.
 - Initiate and institute life-saving emergency care, including CPR.
 - Requesting appropriate investigations and interpretation of their result.
 - Identify pre-operative and post-operative complications promptly and deal with them safely.
 - Document and maintain a record of patients systematically.
 - Seek professional help from other colleagues where needed.
 - Treat patients and their relatives with respect and empathy.
 - Able to counsel caretakers and the family of patient and obtain requisite consent for care.

3.3.2 Radiological procedures

Upon completion of the course, the post graduate student should be able to perform the following:

- Apply knowledge of imaging modality (USG,CT,MR) to investigate surgical diseases of childhood,
- Interpret the radiological images to correctly identify normal structures, abnormalities and pathology,

- Familiarity with conduct and interpretation of intra-operative imaging – radiography and ultrasonography,
- The postgraduate student should be able to perform certain investigative and therapeutic procedures in the radiology suite with due precautions -
 - Esophageal swallow
 - Upper GI contrast study
 - Contrast enema
 - Therapeutic contrast enemas in meconium ileus
 - Reduction of select idiopathic intussusception with radiological (air/contrast enema) or ultrasonography (hydrostatic)
 - Voiding cystourethrogram
 - Retrograde urethrogram
 - Antegrade studies through drainage tubes
 - Percutaneous drainage, biopsy

3.3.3 Physiological studies:

The post graduate student should be able to perform a uroflowmetry and cytometry with standard precautions and interpret the results real time.

3.3.4 Operative procedures:

This includes elective, semi-emergency and emergency procedures.

- Minor surgery
- Major surgery
- Endoscopic procedures
- Minimally invasive surgery

The actual numbers performed may vary according to the patient load of the training unit and related departments.

At the end of his training period, the candidate must be able to PERFORM THE FOLLOWING PROCEDURES INDEPENDENTLY

General:

- Peripheral and central venous access, chemoport and Hickman catheter placement
- Arterial line placement
- Wound debridement and suturing
- Incision and drainage of abscess
- Excision of superficial lesions of skin / subcutaneous planes

- Limb amputation
- Percutaneous/open tumor, viscera (e.g. liver) and lymph node biopsy
- Skin grafting
- Fasciotomy
- Contracture release
- Muscle biopsy
- Nerve biopsy
- Umbilical vein cannulation
- Peritoneal dialysis catheter insertion
- Restraint of the sick child

Head and Neck:

- Repair of cleft lip
- Repair of cleft palate
- Salivary duct / orifice dilatation
- Ranula - marsupialization
- Release of ankyloglossia
- Sistrunk's procedure
- Excision of branchial remnants
- Excision of superficial head and neck masses
- Sternomastoid muscle release
- Diagnostic laryngoscopy
- Esophagostomy
- Cricothyroidotomy
- Injection sclerotherapy of accessible vascular lesions
- Tracheostomy

Thorax:

- Mastectomy
- Bronchoscopy - diagnostic, lavage
- Esophagoscopy - diagnostic
- Diagnostic thoracoscopy
- ICTD insertion
- Repair of eventration diaphragm
- Decortication
- Primary repair of TEF
- Diversion for TEF – esophagostomy, gastrostomy

Abdomen:

- Exploratory laparotomy for acute abdomen
- Laparoscopy - diagnostic, therapeutic minor
- Gastrostomy,
- Fundoplication
- Pyloromyotomy
- Ladd's procedure
- Repair of cong. diaphragmatic hernia -Bochdalek, Morgagni

- Repair of eventration diaphragm
- Per op cholangiogram
- Cholecystectomy, cholecystostomy
- Cystogastrostomy, cystojejunostomy
- Surgery for Vitello-intestinal duct remnants
- Feeding tube jejunostomy
- Ileostomy, colostomy
- Surgery for meconium ileus
- Mesenteric cyst excision
- Appendectomy
- Appendicular abscess – drainage
- Bowel resection, anastomosis
- Secondary suturing (burst abdomen)
- Surgery for inguinal hernias and hydrocele, Umbilical hernia, Femoral hernia
- Rectal biopsy
- Anoplasty for low anorectal malformation
- Splenectomy

Genitourinary

- Cystoscopy - Diagnostic, stent removal
- Nephrostomy
- Suprapubic cystostomy
- Vesicostomy
- Urolithiasis- pyelolithotomy, cystolithotomy
- Meatotomy/meatoplasty
- Distal hypospadias repair
- Urethral fistula repair
- Urethral calibration / dilatation
- Circumcision, preputioplasty and dorsal slit, reduction of paraphimosis
- Orchidopexy- open
- Fowler Stephen Stage 1 (open, laparoscopic) orchidopexy
- Exploration for torsion testes, orchidectomy

Neurosurgery

- Ventriculoperitoneal stunts.
- External ventricular drainage
- Repair of spina bifida

At the end of his training period, the post graduate student must be able to PERFORM THE FOLLOWING PROCEDURES UNDER SENIOR SUPERVISION:

General

- Vascular anastomosis
- HD catheter insertion

Trauma:

- Laparotomy for trauma

- Thoracotomy for trauma

Head and Neck:

- Salivary gland excision
- Excision of lymphatic malformations/ neck masses
- Thyroidectomy
- Repair of H-type TEF

Thorax:

- Bronchoscopy - foreign body extraction
- Esophagoscopy - foreign body extraction , dilatation
- Repair of Pectus Excavatum
- Repair of Pectum Carinatum
- Thoracoscopic procedures, VATS for empyema
- Mediastinal mass excisions
- Pulmonary resection
- Esophageal replacement.

Abdomen:

- Abdominal wall defects - Silo construction
- Surgery for varicocele
- Orchidopexy- lap assisted
- Duodeno-duodenostomy
- Neonatal small bowel atresia – resection, anastomosis
- Laparoscopy - therapeutic, major
- Pull through for Hirschsprung disease
- Excision of duplication cyst
- Operations for necrotizing enterocolitis
- Anorectal myectomy
- Surgery for high anorectal malformation: PSARP, ASARP, AP Pull through etc.
- Colonic resections
- Kasai's portoenterostomy
- Operations for choledochal cyst
- Liver abscess drainage
- Operation for liver hydatid
- Hepatic resection
- Operation for portal hypertension
- Operation for pancreatic pseudocysts
- Pancreatic resection
- Pancreatico-enteric anastomosis
- Adrenalectomy

Genitourinary

- Nephrectomy Nephroureterectomy
- Partial nephrectomy
- Cystoscopy, fulguration of PUV
- Pyeloplasty
- Ureterocele incision

- Ureterostomy
- Ureteric reimplantation
- Urolithiasis - nephrolithotomy, ureterolithotomy
- Exstrophy repair (turn in)
- Bladder augmentation
- Mitrofanoff procedure
- Bladder neck repair
- Ureterosigmoidostomy
- Epispadias repair
- Colonic conduit
- Urethroplasty for Hypospadias
- Operation for intersex disorder
- Correction of penoscrotal transposition

Oncosurgery

- Pediatric solid tumour surgery for Wilms' tumour, Neuroblastoma, Hepatoblastoma, Sacrococcygeal teratoma, Germ cell tumours, Thoracic tumours, Head & Neck tumours, Genitourinary tumours, Soft tissue tumours, Common bone tumours, Lymphomas

Neurosurgery

- Repair of encephalocele
- Repair of occult spinal dysraphism

In addition to the above procedures, the student must be familiar with, prepared a patient for and should have witnessed procedures like:

- UGI endoscopy and variceal sclerotherapy / banding,
- Colonoscopy,
- Extracorporeal shock wave lithotripsy, Percutaneous nephrolithotomy.

4. SYLLABUS

Course contents:

A. Cognitive domain

The following is a broad outline of the syllabus:

1. Basic sciences as applied to Pediatric Surgery

- Medical genetics and gene therapy.
- Antenatal diagnosis and fetal intervention
- Developmental and transitional physiology of the respiratory, cardiovascular and renal systems

- Neonatal physiology and assessment of the surgical neonate.
- Neonatal sepsis
- Nutrition – enteral, parenteral
- Vascular access
- Principles of imaging (radiodiagnosis, nuclear) in Pediatric practice
- Pharmacology and use of common drugs , antibiotics and policy
- Pediatric analgesia and anaesthesia , critical care , mechanical ventilation
- General principles of Endoscopy and Minimal Access Surgery – fetoscopy, genitourinary endoscopy, tracheo-bronchoscopy, laparoscopy, thoracoscopy, robotic surgery
- Biomedical ethics and legal issues in Pediatric surgical practice.
- The organisation of a Pediatric Surgical unit
- HIV/AIDS in children
- National health policy-programs pertinent to Pediatric practice
- Telemedicine and telesurgery - principles , practice and limitations

2. Trauma

- Birth trauma
- Pediatric trauma – general principles.
- Thoracic, abdominal, genitourinary, central nervous system trauma
 - Soft tissue and envenomation injuries
 - Musculoskeletal and vascular trauma
 - Burns
 - Child abuse.

3. Pediatric Oncology

- General principles of oncology, radiotherapy and chemotherapy
- Wilms' tumor
- Neuroblastoma
- Liver tumours

- Rhabdomyosarcoma
- Germ cell tumours
- Other tumor of childhood (outline)-Leukemias, Lymphomas, Bone tumours, CNS tumours,
- Retinoblastoma

4. Transplantation

- General principles
- Kidney and liver transplantation
- Outline of other solid organ and bone marrow transplantation

5. Head and Neck Disorders

- Craniofacial anomalies
- Cleft lip and palate
- Disorders of the upper airway and oral cavity.
- Salivary glands
- Disorders of lymph nodes.
- Thyroid and parathyroid gland
- Cysts and sinuses of the neck
- Torticollis

6. Thoracic Disorders

- Congenital chest wall deformities.
- Disorders of the breast.
- Diaphragmatic hernia and eventration
- Mediastinal mass lesions.
- Endoscopy of the upper aerodigestive tract.
- Congenital tracheal and Bronchopulmonary/ foregut malformations
- Infective pleuro-pulmonary condition.
- Congenital oesophageal anomalies

- Oesophageal motility disorders ,achalasia cardia , gastro-esophageal reflux
- Oesophageal rupture, injury, stricture, perforation.
- Oesophageal replacement.

7. Abdominal Disorders

- Umbilical disorders and abdominal wall defects.
- Inguinal hernias and hydroceles
- Testicular maldescent, torsion
- Hypertrophic pyloric stenosis.
- Duodenal atresia, annular pancreas.
- Jejunoileal atresia and stenosis
- Meconium ileus
- Meckel's diverticulum
- Intussusception.
- Disorder of midgut rotation.
- Short bowel syndrome
- Gastrointestinal endoscopy and laparoscopy.
- Gastrointestinal bleeding
- Gastrointestinal duplications.
- Mesenteric and omental cysts
- Ascites
- Polypoid disease of the GIT
- Necrotising enterocolitis.
- Intestinal stomas
- Primary peritonitis.
- Inflammatory bowel disease in children.
- Colonic atresia and functional obstruction.
- Appendicitis
- Hirschsprung disease, neuromuscular disorders of intestines
- Anorectal malformations.
- Congenital short colon /pouch colon

- Colonic and rectal tumours
- Neonatal/Infantile obstructive cholangiopathy
- Congenital biliary dilatation.
- Infective and inflammatory hepatobiliary disorders
- Benign liver tumours
- Portal hypertension
- Disorders of the pancreas
- Splenectomy and post-splenectomy sepsis.
- Adrenal gland.

8. Genitourinary and related disorders

- Renal agenesis, dysplasia, cystic disease, ectopia
- Pelvic ureteral junction obstruction
- Vesicoureteric reflux
- Infective and inflammatory renal disorder.
- Pediatric urolithiasis
- Congenital ureteric anomalies.
- Prune belly syndrome
- Urinary diversion and undiversion, bladder augmentation
- Disorders of bladder function.
- Structural bladder disorders
 - Exstrophy – epispadias complex
 - Hypospadias.
- Anomalies of the external genitalia
- Disorders of Sex Differentiation
- Abnormalities of the female genital tract.

9. Miscellaneous Pediatric Surgical Disorders

- Spina bifida
- Hydrocephalus
- Congenital heart disease

- Congenital orthopaedic deformities
- Amputation, bone and joint infections
- Conjoined twins
- Hemangiomas & vascular malformations.

5. TEACHING AND LEARNING METHODS

Teaching programs will need to be held on all working days (at least one hour per day)

Activities
Journal Club
Didactic lectures
Seminars/ Webinars
Hospital (Grand Rounds/Clinical meeting/Audit meet)
Clinical Case Presentation/ presentation to multidisciplinary tumour boards

5.1 TEACHING AND LEARNING METHODS

General principles - Acquisition of practical competencies being the cornerstone of post graduate medical education, PG training should be skills oriented. Learning in PG program should be essentially self-directed and primarily emanating from clinical and academic work. The formal sessions are merely meant to supplement this core effort. The post graduate student should be given the responsibility of managing and caring for patients in a gradual manner under supervision.

Formal teaching sessions: This should include regular bedside case presentations and demonstrations, didactic lectures, seminars/Webinars, journal clubs, clinical meetings, and combined conferences with allied departments, Audit meet, clinical case presentation etc. as per sample schedule given below:

Didactic Lectures by faculty: In addition, lectures covering recent advances in all aspects of pediatric surgical conditions would be taken by faculty. All post graduate students will be required to attend these lectures.

Short term courses on the following basic and clinical aspects must be included:

- Research methodology and bio-statistics
- Laboratory medicine techniques/courses relevant to Pediatric Surgery
- Use of computers/ data science management in medicine,
- Bioethics, ethical issues involved in pediatric surgery
- Hospital waste management,
- Health economics.

5.1. The M.Ch. Pediatric Surgery training program will include two main arms:

5.1.1. Formal training and learning

5.1.2. Experiential learning

5.1.1. Formal training and learning will include the topics listed in the syllabus: The **modalities for formal training** will be as follows:

1. **Seminars/Webinars:** To be held once a week and presented by the trainee under supervision of teaching faculty.
2. **Journal Review:** To be held once a week under supervision of teaching faculty. It should include discussion on recent articles, which relate to various topics in Pediatric Surgery and allied disciplines.
3. **Clinical Case presentation:** Representative clinical cases shall be presented and discussed in detail in presence of faculty.
4. **Operative procedures:** This session, recommended once a month, aims at discussing common operative procedures and practical details.
5. **Treatment Planning:** The trainee must discuss the planning of a given patient who is being worked up for surgery. The idea of this academic exercise is to familiarize the trainee with the objectives of planning in a given patient through group discussion/ multidisciplinary tumour boards based on evidence-based medicine.
6. Pediatric Radiology/Nuclear Medicine conferences should be held once a week in which the radiological and nuclear medicine investigations of various cases are discussed in consultation with the faculty of Radiology and Nuclear Medicine.

7. **Clinical grand rounds:** A clinical grand round, involving presentation of unusual and difficult cases, is to be done by a post graduate student, once a week, in the presence of all the clinical staff belonging to the department of Pediatric surgery. The exercise is to develop the clinical acumen of the trainee.
8. **Clinico-pathological conference:** Special emphasis is made on the surgical pathology, histology review and autopsy discussions.
9. **Lecture/discussion:** Lectures on newer topics by faculty, in place of seminar, is to be arranged as per need.
10. **Teaching and training responsibilities (Pedagogy skills):** A final year M.Ch. trainee should be entrusted with the responsibilities of teaching post graduate students of General Surgery and allied disciplines.
11. **Training in research methodology:** The purpose of the exercise is to impart proficiency in research methodology to the trainee. This would be a mandatory component of training. All M.Ch. trainees must complete research projects as per requirement of concerned Universities, under the supervision of a principal supervisor and appropriate number of co-supervisors which would enable the trainee to attain proficiency in collecting clinical / experimental data and analyze them in a scientific way using appropriate statistical methods.
12. **Attendance and presentation at academic meets:** The student must attend accredited scientific meetings (CME, symposia, and conferences) once or twice a year. He should present at least one poster or read one paper at a national/state conference in Pediatric Surgery or sub-speciality (Pediatric Urology, Pediatric Surgical Oncology etc.) during the second and third year of the training period.
13. **Research Publication (Research skills):** A student has to present one paper which is published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination. The research has to be done under the direct supervision of the supervisor or his associate(s). Through this exercise, the trainee would learn how to collect and analyze data, make observations in a scientific manner, and use appropriate statistical methodology. The trainee would learn the

art of putting the outcome of observations and results in an appropriate format of a scientific paper that is relevant to a particular journal.

- 14. Use of Skills lab stations:** The skills lab must facilitate training and acquisition of both common (e.g. endotracheal intubation, ICT drainage, Central line insertion) skills in real life situations and uncommon skills (laparoscopic suturing, cricothyroidotomy etc.) that the student may not encounter often.
- 15. Mortality and morbidity (Audit) meetings:** Departmental and interdepartmental / institutional

5.1.2. Experiential learning

Apart from routine postings in ward, OPD, operation theatre and speciality clinics, the M,Ch (Pediatric Surgery) trainee will be posted in the following allied specialities. The total duration of these postings shall not exceed three months. There is no specified compulsory posting in Emergency Medicine/Casualty; however, the student will attend the emergency cases pertaining to/referred to their department at the Emergency/ Casualty in the course of the routine clinical duties.

- 1. Pediatric Intensive Care Unit: Duration- 2-4 weeks.** This is intended to familiarize the student to the principles of pediatric medical intensive care and its applications to pediatric surgical care.
- 2. Neonatology Intensive Care Unit: Duration- 2-4 weeks.** During this posting, the candidate will receive training on care of the sick neonates, particularly premature and small for date.
- 3. Optional External Posting:** Other postings may be scheduled as deemed necessary for the fulfilment of curricular demands, e.g. Pediatric Oncology, etc. in the third year, in the same or in another tertiary teaching Centre/Institute. The posting in another institute may be for a special training that is currently not available at the home institute. It may be for 4-8 weeks with the prior approval of the Head of the Institution. Prescribed institutional regulations will be adhered to for such an external posting.
- 4. Administrative experience:** The final year post graduate student should be entrusted with administrative responsibilities including preparation of academic

programme, patient management, functioning of the ward and outpatient department. These may include:

- Admission of patients,
- Preparing the operation theatre lists,
- Improving the functioning in the ward through the supervisor,
- Preparing list of topics for teaching of junior trainees posted in the department,
- Organizing the posting of trainees in various work stations of the department as per the demand of the situation.

5. **Log Book**

The trainees must maintain a log book of the work carried out by them and the training program undergone during the period of training including details of the surgical operations assisted or done independently. The log book should be checked and assessed periodically by the faculty members imparting the training.

During the training programme, patient safety is of paramount importance; therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently. For this purpose, provision of skills laboratories in medical colleges is mandatory.

6. ASSESSMENT

A. FORMATIVE ASSESSMENT during the training includes:

- | | |
|-----------------------------------|--------------------------------------|
| • Personal attributes | Ongoing after each clinical posting |
| • Clinical skills and performance | -do- |
| • Academic activities | -do- |
| • Theory assessment | End of 1-, 2- and at 2years 9 months |
| • Practical assessment | -do- |

Clinical skills and performance, academic performance and personal attributes shall be graded on a scale of 1 to 5 (5 being the highest). The academic presentations shall be graded at the time of presentation by the faculty in-charge. Evaluation on clinical skills and personal

attributes etc. shall be done by the unit/department in-charge at the end of every semester. The student to be assessed periodically as per categories listed in post graduate student appraisal form (Annexure I).

B. SUMMATIVE ASSESSMENT at the end of the training will be as follows:

The **M.Ch. examination** shall be in two parts:

1. **Theory:** There shall be four theory papers as follows:

Paper I: Basic Sciences in Pediatric Surgery, Trauma, Transplantation

Paper II: Regional Pediatric Surgery (Head and Neck, Thorax),
Pediatric Oncosurgery

Paper III: Regional Pediatric Surgery (Abdomen, Genitourinary)

Paper IV: Recent advances in Pediatric surgery

The theory examination shall be held in advance before the clinical and practical examination, so that the answer books can be assessed and evaluated before the commencement of the clinical/practical/oral examination. The post graduate students for M.Ch in Pediatric surgery will be examined also in surgical procedures.

2. **Practical:** The practical examination should consist of the following and should be spread over two days, if the number of candidates appearing is more than one:

- a. Four cases from various sections of Pediatric surgery/subspecialities:
History taking, physical examination, interpretation of clinical findings, differential diagnosis, investigations, prognosis and management.
- b. Ward rounds comprising of discussion of practical problems in the management of pediatric patients undergoing surgery.
- c. Viva-voce examination
 - Instruments and operative procedures
 - Radiology and imaging
 - Surgical Pathology

- Thesis and logbook evaluation

3. Theory and Practical examination will be conducted as per University guidelines.

Other recommendations: Systematic and periodic formative assessment should be done every 6 months and feedback should be given to trainee.

Recommended Reading:

Books (latest edition)

1. Coran AG, Adzick NS, Krummel TM, Laberge JM, Shamberger RC, Caldamone AA. Pediatric Surgery, 7Ed: Elsevier - Health Sciences Division; 2012.
2. Holcomb GW, Murphy JP, Peter SD. Holcomb and Ashcraft's Pediatric Surgery, 7Ed: Elsevier; 2019.
3. Hutson JM, Brien MO, Woodward AA, Beasley SW. Jones Clinical Pediatric Surgery: Diagnosis and Management, 6Ed: Wiley-Blackwell; 2008.
4. Docimo SG, Canning D, Khoury A, Salle JLP. The Kelalis-King-Belman Textbook of Clinical Pediatric Urology, 6Ed: CRC Press; 2018.
5. Pizzo PA, Poplack DG, Adamson PC, Blaney SM, Helman L. Principles and Practice of Pediatric Oncology, 7Ed: Wolters Kluwer; 2016.
6. Davenport M, Spitz L, Coran A. Operative Pediatric Surgery, 7 Ed: CRC Press; 2013.
7. Holcomb GW, Rothenberg SS. Atlas of Pediatric Laparoscopy and Thoracoscopy, 2 Ed: Elsevier; 2021.
8. Eichenwald EC, Hansen AR, Stark AR, Martin C. Cloherty and Stark's Manual of Neonatal Care, 8Ed: Wolters Kluwer; 2017.
9. Kliegman RM, Stanton BMD, Geme JS, Schor NF. Nelson Textbook of Pediatrics: Elsevier Health Sciences, 21 Ed; 2019.
10. Farquharson M, Hollingshead J, Moran B. Farquharson's textbook of Operative General Surgery, 10 ed: CRC Press; 2015.
11. Gray SW, Skandalakis JE. Embryology for surgeons: the embryological basis for the treatment of congenital defects, 2 ed: Lipincott Williams and Wilkins; 1994.
12. Glover T, Mitchell K. An Introduction to Biostatistics, 3 ed: Waveland Press; 2015.

13. David L. Katz, Joann G. Elmore, Wild D, Sean C Lucan. Jekel's Epidemiology, Biostatistics, Preventive Medicine, and Public Health: Elsevier Health Sciences; 2013.
14. Coley BD. Caffey's Pediatric Diagnostic Imaging, 13 ed: Elsevier; 2018.
15. Husain AN, Dehner LP. Stocker and Dehner's Pediatric Pathology, 5 ed: LWW; 2021.
16. Holschneider AM, Hutson JM. Anorectal Malformations in Children: Embryology, Diagnostics, Surgical Treatment and Follow up: Springer, 2006.
17. Puri P. Newborn Surgery, 4 ed: CRC Press;2019.
18. Hadidi A, David MA. Hypospadias Surgery: An Illustrated Guide: Springer;2013.
19. Barry P, Morris K. Pediatric Intensive Care (Oxford Specialist Handbooks in Pediatrics), 1 ed: Oxford University Press; 2017.
20. Papandria DJ, Besner GE, Moss RL, Diefenbach KA. Operative Dictations in Pediatric Surgery, 1 ed: Springer; 2019.

Journals

3-5 international and two national journals (all indexed).

Essential

- Journal of Indian Association of Pediatric Surgeons
- Journal of Pediatric Surgery
- Pediatric Surgery International
- European Journal of Pediatric Surgery
- Journal of Pediatric Urology
- Seminars in Pediatric Surgery
- British Journal of Urology International Indian Pediatrics
- Indian Journal of Pediatrics

Optional

- The Journal of Pediatrics
- Pediatrics
- Pediatrics Clinics of North America
- Any other relevant journal pertaining to pediatric surgery

Postgraduate Students Appraisal Form
Clinical discipline

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM.....TO.....

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1.	Journal based / recent advances learning				
2.	Patient based /Laboratory or Skill based learning				
3.	Self directed learning and teaching				
4.	Departmental and interdepartmental learning activity				
5.	External and Outreach activities / CMEs				
6.	Thesis / Research work				
7.	Log Book maintenance				

Publications

Yes/ No

Remarks* _____

*REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.

SIGNATURE OF ASSESSEE

SIGNATURE OF CONSULTANT

SIGNATURE OF HOD

दूरभाष/Phone: 25367033, 25367035

फैक्स/Fax: 0091-11-25367024

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राष्ट्रीय आयुर्विज्ञान आयोग National Medical Commission

No. NMC/Secy/2021/41/ 025834

Date: 13th October 2021

Advisory regarding the issue of LGBTQIA+ Community and necessary changes in competencies of CBME- curriculum

This is in pursuance of the direction passed by the Hon'ble Madras High Court in writ petition no. 7284 of 2021. It has been noted that the various textbooks of medical education mainly of Forensic Medicine & Toxicology subject and Psychiatry subject contains unscientific information about virginity and also contains derogatory remarks against LGBTQIA+ Community and homosexuals.

2. In this connection, all the Medical Universities/Colleges/Institutions are requested that while teaching UG & PG students wherever the issue of gender or similar kind arise, the mention of Clinical history or complaints or signs/symptoms, examination findings or history about nomenclature shall not be taught in such a way that it becomes/perceived in any way derogatory/discriminatory/ insulting to LGBTQIA+ community.

3. Further, all the authors of Medical Text Books are hereby instructed to amend the information about virginity, LGBTQIA+ Community and homosexuals, etc. in their textbooks according to the available scientific literature, guidelines issued by the Government, and directions passed by the Hon'ble Courts. Furthermore, all the Medical Universities/Colleges/Institutions are requested not to approve the books as recommended books by the University if the books have unscientific, derogatory, and discriminatory information about virginity, LGBTQIA+ Community, and homosexuals.

4. The publication shall be applied strictly by the Government and Authorities concerned.


13/10/2021
(Dr. ANJULA JAIN)
Secretary, NMC

राष्ट्रीय आयुर्विज्ञान आयोग

**National Medical Commission
(Undergraduate Medical Education Board)**

No. U.11026/1/2022-UGMEB

Dated the 31st March, 2022

Circular

Subject : Implementation of new Competency Based Medical Education for Undergraduate Course Curriculum.

The new Competency Based Medical Education for Undergraduate Course Curriculum was discussed in detail in the 6th meeting of National Medical Commission, which was held on 24th March, 2022 at New Delhi.

2. After detailed discussion and deliberation, it has been unanimously decided in the said meeting of the Commission to implement new Competency Based Medical Education for Undergraduate Course Curriculum from the current batch of MBBS students i.e. 2021-22, admitted in the month Feb-March 2022.

3. The new Competency Based Medical Education for Undergraduate Course Curriculum would be implemented with the objective of covering all three domains of learning (Cognitive, Affective & Psychomotor). The new course curriculum introduced in August 2019 enriches the medical student with a sound base and balanced approach to overall aspect with the introduction of foundation course which includes Family Adoption Programme, Yoga, meditation, Local Language adaptation and skills.

4. All State Governments/UTs, universities and medical colleges/institutes are requested to take immediate necessary steps to implement the new Competency Based Medical Education for Undergraduate Course Curriculum from the current batch of MBBS students i.e. 2021-22, admitted in the month Feb-March 2022.

Shanior

**(Dr. Aruna V. Vanikar)
President**

Encl:

- (i) Guidelines for implementation of new CBME Course curriculum.
- (ii) Academic Calendar for MBBS Batch
- (iii) Month-wise schedule of new CBME Course
- (iv) Curriculum for Family Adoption Programme
- (v) Brief modified transliteration of Maharshi Charak Shapth

**Guidelines for implementation of new CBME Course curriculum for MBBS
batch 2021-22 admitted in Feb-March 2022**

1. The said guidelines are for the UG CBME **2021 (admitted in 2022)** batch.
2. The curriculum of UG CBME 2021 will begin from **14th Feb 2022** in all medical colleges across the country. The basic framework and inclusions of CBME will not be disturbed as they are vital components of outcome-based education. It is mainly the **redistribution of hours** in view of COVID-19 pandemic within the time frame that needs consideration for 2021-'22 (admitted in Feb. 2022) batch.
3. Redistribution with timeline of professional years for 2021-'22 (admitted in Feb. 2022) is provided in slides herewith.

Since the duration for 1st professional has been reduced from 14 months to 12 months, the period can be adjusted by :

- a. Having one week of Foundation Course at the beginning of the academic calendar and then spreading remaining three weeks of Foundation Course in first six months beyond curricular hours
 - b. Allocating Sports & Extracurricular hours for regular teaching
 - c. Reducing duration of vacation (1 week in Summer & 1 week in Winter, at the discretion of University and college)
 - d. Final, 1st exams will be for Forensic Medicine, Toxicology and Community Medicine
 - e. All clinical subjects will be taught as per curriculum parallel and exams will be covered under NEXT.
4. **Early clinical exposure and Integration** retained since they are all teaching-learning methods/strategies for addressing identified competencies.

5. Self directed learning (SDL): Some SDL hours can be reduced, specifically from Phase-I subjects like Anatomy (there are 40 hours), Physiology (20 hours). Some SDL hours can go beyond office hours if required (as such also students may be required to do certain things for SDL beyond regular hours).

6. Electives promote academic flexibility and may be offered onsite based on student's need and choice. One month of Electives (Block A & B, 15 days each) can be adjusted for this batch, wherein Block A (pre/para clinical electives) can have electives along with clinical postings and Block B (clinical electives) without clinical posting.

7. Family adoption program is recommended as a part of curriculum of Community Medicine and should begin from 1st professional year and remain throughout the curriculum. The orientation towards the same may be a part of foundation course under the theme of 'Field visit to community health centre' (8 hrs) which is already allocated to foundation course in GMER 2019.

The family adoption shall include villages not covered under PHC adopted by medical college, and if travel time from college to site is more than 2 hours on week-ends, in such situation, bastis / jhuggis/ towns or on outskirts of cities may be adopted.

7. Modified 'Maharshi Charak Shapath' is recommended when a candidate is introduced to medical education.

8. Yoga training is recommended to be initiated during foundation course, (1 hour, preferably in the morning in orientation week). Yoga practices shall be for maximum 1 hour every day during the period of 10 days beginning from 12th June every year to be culminated on International Yoga day, i.e. 21st June, to be celebrated in all medical schools across the country. These may be practiced by all batches of MBBS. Yoga module will be made available to all

colleges by UGMEB- NMC. However colleges may adopt their own modules. Yoga unit may be inducted under PMR department or any other department of all colleges at their discretion.

9. **Assessment:** A robust continuous formative and internal assessment is required to ensure competencies and thereby a competent medical graduate. If required, we can have two internal assessments and the third internal assessment can be calculated from various unitary and continuous tests taken throughout the year.

10: **Supplementary examinations:**Supplementary exam be conducted between 4 to 6 weeks from the date of declaration of results of regular university examinations. The result of Supplementary examinations be declared within 10 days from the date of completion of examinations.

11. There shall be no supplementary/ repeater batch. For students who fail in their university examination:

- Students who pass in 1st MBBS supplementary examination shall be offered special classes and ward postings to cover up the syllabus, so that he/she copes up with subjects. Subsequently (after passing in supplementary examination) the student shall continue with his/her regular batch. Attendance of special classes/ postings for such students shall be counted. Students who fail to pass in supplementary examination, shall be joining the subsequent junior batch.

- Students who pass in 2nd MBBS supplementary examination shall be offered special classes and ward postings to cover up the syllabus, so that he/she copes up with subjects. The student shall not join classes of the Final MBBS till he/she is given a chance of passing in first supplementary examination. He/she shall continue with his regular batch after passing in supplementary examination of 2nd MBBS.

Attendance of special classes/ postings be counted. Students who fail to pass in supplementary examination of 2nd MBBS may be allowed to continue with his/her regular batch. However the student shall have to pass 2nd MBBS before taking up Final MBBS examination, as per the existing guidelines.

12. Details and guidelines on NEXT examination shall be notified by NMC.

ACADEMIC CALENDER FOR MBBS BATCH(2021-22) ADMITTED IN FEB-MAR 2022

Professional year	Time frame	Months available (Teaching + Exam)	Comparison with GMER 2019
1 st	14 th Feb '22 to 31 st Jan '23, Exam - Feb.	11.5 months (incl. F.C.) Exam, Result = 1 month	14 months (incl. one month FC)
2 nd	1 st March, '23 to 29 th Feb, '24 Exam- March, '24	12 months Exam, Result = 1 month	12 months
3 rd (III-part-1)	1 st April, '24 to 15 th Jan, '25, Exam – till 31 th Jan, '25	9.5 months Exam - 15 days (FMT, Community Med)	13 months
Electives + results	Block A–(first half) Feb, '25 Block B–(second half) Feb, '25	1 month	2 months
4 th (III-part-2)	1 st March, '25 to 31 st March, '26	13 months NeXT (theory) – April, '26 Univ. (practical) – April, '26	13 months
Internship	1 st May, '26 to 30 th April '27,	12 months	12 months
NeXT & Counselling	May, June, '27	Counselling before 15 th June	1 month
PG	July, '27		

MONTH-WISE SCHEDULE FOR NEW CBME COURSE FOR MBBS BATCH 2021-22 JOINED IN FEB-MAR 2022

MBBS	1	2	3	4	5	6	7	8	9	10	11	12
2022	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	months	14 TH -1	2	3	4	5	6	7	8	9	10	11
2023	12	Exam, Results	2 ND PROF-1	2	3	4	5	6	7	8	9	10
2024	11	12	Exam, Results	3 RD 1ST-1	2	3	4	5	6	7	8	9
2025	10- exam in 2 nd half	11-Electives	12	13	14	15	16	17	18	19	20	21
2026	22	23	24	25- NEXT & Univ. final practical, Results	INTERNS HIP- 1	2	3	4	5	6	7	8
2027	9	10	11	12	NEXT, counseli ng	couns elling	PG					

CURRICULUM FOR FAMILY ADOPTION PROGRAMME

Need of the Program:

In India, around 65.5 % of population resides in rural settings (as per 2020 statistics) whereas availability of health care facilities and services are skewed towards urban set ups. Though adequate healthcare supplies exist in the community, it is the access to healthcare to a rural citizen that is a major concern. Issues like health illiteracy, ignorance about communicable and non communicable diseases, means to reach health care facility, services, take time off from their daily wages work and workforce shortages are some of the barriers that limits timely and quality health related awareness and care leading to a scenario of 'Scarcity in abundance'. Hence there is a need to take measures to make healthcare more accessible to the rural and needy population and impart community based and community oriented training to budding healthcare professionals.

Aim:

Family adoption program aims to provide an experiential learning opportunity to Indian Medical graduates towards community based health care and thereby enhance equity in health.

Objectives of the Program:

During the Medical UG training program, the learner should be able to :

1. Orient the learner towards primary health care
2. Create health related awareness within the community
3. Function as a first point of contact for any health issues within the community
4. Act as a conduit between the population and relevant health care facility
5. Generate and analyse related data for improving health outcomes and Evidence based clinical practices.

Specifics of the Program:

Family adoption program is recommended as a part of curriculum of Community Medicine and should begin from 1st professional year with competencies being spread in ascending manner for entire MBBS training program. The orientation towards the same may be a part of Foundation course under the theme of 'Field visit to community health centre' (8 hrs) which is already allocated to foundation course as per GIMER 2019.

The family adoption shall preferably include villages not covered under PHCs adopted by medical college. If transit time from college to site is more than 2 hours, then basitis / jhuggis/ towns on outskirts of cities may be considered for family adoption. Medical students may be divided into teams and each team may be allocated visits, with 5 families per student. These families may be introduced during their first visit; however, the model may be flexible depending upon the number of students and available families for adoption. The entire team should work under a mentor teacher for entire part of the training program.

Other considerations:

Every college may arrange one diagnostic medical camp in the village wherein identification of: anemia, malnutrition in children, hypertension, diabetes mellitus, ischemic heart diseases, kidney diseases, any other local problems may be addressed.

If required, patients shall be admitted in the hospital for acute illness under care of student, charges may be waived off or provide concession or govt. schemes.

For chronic illness, students shall be involved.

Subsidized treatment charges may be provided under govt. schemes or welfare schemes.

Camps may be arranged by Dean and Community Medicine/ P.S.M. department with active involvement of Associate/ Asst. Professors, social worker and supporting staff. Local population may be involved with village leaders.

Visit by students be made to the visit as mentioned in table below. Annual follow up diagnostic camp can be continued by the PSM department. As a step towards environment consciousness, students may be encouraged for tree plantation/medicinal plants around beginning of monsoons, in the environs of the families adopted. This could be also included in the environs of the hostels/ residence of students wherever possible.

At the end of the programme, students may be envisioned to become leaders for the community.

TARGETS TO BE ACHIEVED BY STUDENTS:

First Professional Year:

- Learning communication skills and inspire confidence amongst families
- Understand the dynamics of rural set-up of that region
- Screening programs and education about ongoing government sponsored health related programs
- Learn to analyse the data collected from their families
- Identify diseases/ ill-health/ malnutrition of allotted families and try to improve the standards

2nd Professional Year

- Inspire active participation of community through families allotted
- Continue active involvement to become the first doctor /reference point of the family by continued active interaction
- Start compiling the outcome targets achieved

3rd Professional Year

- Analysis of their involvement and impact on existing socio-politico-economic dynamics in addition to improvement in health conditions
- Final visit in the last months in advance to examination schedule, to have last round of active interaction with families**

-prepare a report to be submitted to department addressing:

- 1) Improvement in general health
- 2) Immunization
- 3) Sanitation
- 4) De-addiction
- 5) Improvement in anemia, tuberculosis control
- 6) Sanitation awareness
- 7) Any other issues
- 8) Role of the student in supporting family during illness/ medical emergency
- 9) Social responsibility in the form of environment protection programme in form of plantation drive (medicinal plants/trees), cleanliness and sanitation drives with the initiative of the medical student

Professional Year	Competency The student should be able to	Objectives	Suggested Teaching Learning methods	Suggested Assessment methods	Teaching Hours
1st Professional	- Collect demographic profile of allotted families, take history and conduct clinical examination of all family members - Organize health check-up and coordinate treatment of adopted family under overall guidance of mentor - Maintain communication & follow up of remedial measures - Take part in environment protection and sustenance activities.	By the end of this visit, students should be able to compile the basic demographic profile of allocated family members By the end of this visit, students should be able to report the basic health profile and treatment history of allocated family members By the end of this visit, students should be able to provide details of communication maintained with family members for follow-up of treatment and suggested remedial measures By the end of this visit, students should be able to report the activities undertaken for environment protection and sustenance	Family survey, Community clinics, Community clinics, Multispecialty camps Reporting of follow up visits, PRA techniques (transact walk, group discussion) Community clinics, Community clinics, Participation in and Process documentation of activities (NSS activities) along with reporting of photographic evidences	Community case presentation, OSPE, logbook, journal of visit Community case presentation, OSPE, logbook, journal of visit Community case presentation, OSPE, logbook based certification of competency, journal of visit	6 hrs 9 hrs 6 hrs 6hrs

		like study of environment of families, tree plantation/ herbal plantation activities conducted in the village		logbook based certification of competency, journal of visit	(Total 27 hrs, 9 visits)
2 nd Professional	- Take history and conduct clinical examination of all family members - Organize health check-up and coordinate treatment of adopted family under overall guidance of mentor - Maintain communication & follow up of remedial measures	By the end of this visit, students should be able to compile the updated medical history of family members and report their vitals and anthropometry By the end of this visit, students should be able to report the details of clinical examination like Hb %, blood group, urine routine and blood sugar along with treatment history of allocated family members By the end of this visit, students should be able to provide details of communication maintained with family members for follow-up of treatment, and suggested remedial	Family survey, Community clinics Community clinics, Multispecialty camps Reporting of follow up visits, PRA techniques (transact walk, group discussion) Community clinics,	Community case presentation, OSPE, logbook, journal of visit Community case presentation, OSPE, logbook, journal of visit Community case presentation, OSPE, logbook based certification of competency,	6 hrs 9 hrs 9 hrs

	Take part in environment protection and sustenance activities.	measures along with details of vaccination drive	Participation in and Process documentation of activities (NSS activities) along with reporting of photographic evidences	journal of visit	6 hrs (Total 30 hrs, 6 visits)
3 rd Professional	Final counselling of the family members of allotted families and analyze the health trajectory of adopted family under overall guidance of mentor	By the end of this visit, students should be able to report the details of clinical examination like Hb %, blood group, urine routine and blood sugar along with treatment history of allocated family members	Family survey, Community clinics	Community case presentation, OSPE, logbook, journal of visit	3hrs
		By the end of this visit, students should be able to report the details of clinical examination like Hb %, blood group, urine routine and blood sugar along with treatment history of allocated family members	Community clinics, Multispecialty camps	Community case presentation, OSPE, logbook, journal of visit	4 hrs

				4 hrs
By the end of this visit, students should be able to provide details of communication maintained with family members for follow-up of treatment, and suggested remedial measures along with details of vaccination drive	Reporting of follow up visits, PRA techniques (transact walk, group discussion) Community clinics,	Community case presentation, OSPE, logbook based certification of competency, journal of visit		
- By the end of this visit, students should be able to report the activities undertaken for environment protection and sustenance like study of environment of families, tree plantation/ herbal plantation activities conducted in the village	Participation in and Process documentation of activities (NSS activities) along with reporting of photographic evidences	logbook based certification of competency, journal of visit	4 hrs	
By the last visit, students should be able to analyze trajectory of adopted family measures adopted at individual, family and community level	- Small group discussion (report of the health trajectory of adopted family)	-Logbook based certification of competency, journal of visit	+6 hrs in last visit (total 21 hrs, 5 visits)	

TOTAL	1 st Prof 2 nd Prof 3 rd Prof	9 visits 6 visits 5 visits 20 visits	27 hrs 30 hrs 16 hrs +5 hours in last visit 78 hrs		
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PROTO-TYPE LOG BOOK FOR FAMILY ADOPTION

COLLEGE NAME, UNIVERSITY

ADDRESS DETAILS

NAME OF THE STUDENT:

ROLL NO.:

VILLAGE NAME:

TEHSIL/ DISTRICT:

STATE/ UNION TERRITORY:

NAME OF THE MENTOR:

MENTOR STATUS: Asst. Prof/ S.R. And Details: (If changed, details of subsequent mentors)

NAME OF ASHA WORKER:

ADDRESS OF ASHA WORKER:

EXPERIENCE (SINCE HOW MANY YEARS IS HE/ SHE EMPLOYED)

(SEPARATE PAGE FOR EACH FAMILY BE MAINTAINED)

-FAMILY NAME AND ADDRESS

- Approximate size of living space of house-hold
- Malaria/ flu/ etc pertinent to the region
 - If there is any illness or medical emergency required by the house-hold, the student should take initiative in being the primarycontact for the family.
 - The student in turn should consult his/her mentor for further management of the patient.
 - The hospital to which the college is attached must provide treatment facilities to the patient.
 - Government schemes may be utilized for optimal management.
 - Follow-up records must be maintained by the student. These must be periodically evaluated by mentors with the help of senior residents.
 - The entire data sheet may be prepared by every student and submitted latest by the end of the last visit for evaluation.
 - Progress notes must include every demographic point and history recorded.

PROTO TYPE LOG BOOK

NAME	AADHAAR NO.	BIRTH DATE	AGE	POSITION IN FAMILY	DIETARY HABITS, DIET	LITERACY: EDUCATIONAL QUALIFICATION	EMPLOYMENT for income source, eg. Labourer/ land owner/ teacher, etc	NAME OF SCHOOL OF CHILD	ADDICTIONS IF ANY	HEIGHT (CMS)	WEIGHT (KG)
				(eg. Head, wife, sibling order, grand mother, etc)		annual progress of children to be recorded		grade/ standard, medium of learning			

1ST PROF/ MBBS

DATE OF

SR. NO. VISIT

1

2

2ND

MBBS

1

2

FINAL-1ST

PROF-

FINAL

MBBS-1ST

1

2

PROTO TYPE LOG B

IST PROF/ MBBS	DATE OF SR. NO. VISIT	IMMUNIZATI ON STATUS	PULSE	BP	R.R.	BLD GP, Rh	HEMOGLOBI N	URINE PROTEIN	URINE SUGAR	POS.FINDIN G IN URINE	BLOOD SUGAR	IMMUNIZATION STATUS	ORAL CHECK-UP	HYGEINE STATUS
1	1													
2	2													
2ND MBBS														
1	1													
2	2													
FINAL-1ST PROF- FINAL MBBS-1ST														
1	1													
2	2													

BRIEF TRANSLITERATION OF MAHARSHI CHARAK SHAPATH

- ❖ During the period of study I shall live a disciplined life with my teachers and peers. My action shall be guarded, service oriented and free from indiscipline and envy. In my dealings I shall be patient, obedient, humble, constantly contemplative and calm. I shall aim my full efforts and ability towards the desired goal of my profession.
 - ❖ As a Physician, I shall always use my knowledge for welfare of mankind.
 - ❖ I shall always be ready to serve patients, even if I am extremely busy and tired. I shall not harm any patient for the sake of monetary or selfish gains, nor shall I entertain a desire for lust, greed or wealth. Immorality shall not emerge even in my thoughts.
 - ❖ My dressing shall be decent yet impressive and inspiring confidence. My conduct shall always be appropriate, pleasant, truthful, beneficial and polite. I shall use my experience in actions appropriate for that time and place.
 - ❖ I shall constantly endeavor to accomplish/ keep updated with the latest developments in the field and widen my knowledge.
 - ❖ I shall treat patient of gender other than mine in presence of relatives or attendants.
 - ❖ When examining a patient, my discretion, attention and senses shall be concentrated on the cure of the disease. I shall not divulge the confidentiality related to the patient or family inappropriately.
 - ❖ Although an authority (in my subject), I shall not display my knowledge and skill with arrogance.
-

राष्ट्रीय आयुर्विज्ञान आयोग
National Medical Commission
(Undergraduate Medical Education Board)

No. U. 11026/1/2022-UGMEB

Dated the 31st March, 2022

Circular

Subject : Amalgamation of old and new batch of MBBS students in the new CBME Course Curriculum.

The aforementioned subject was discussed and deliberated in detail in the 6th meeting of National Medical Commission, which was scheduled to be held on 24th March, 2022 at New Delhi.

2. It has been unanimously decided in the said meeting of the Commission that the old and new batch of MBBS students should be amalgamated in the new CBME Course Curriculum for MBBS students from the current academic session i.e. 2021-22 with the objective of covering all three domains of learning (Cognitive, affective & Psychomotor), subject to informed written consent of the students. The new course curriculum introduced in August 2019 enriches the medical student with a sound base and balanced approach to overall aspect with the introduction of foundation course which includes Family Adoption Programme, Yoga, meditation, Local Language adaptation and skills. The curriculum committee of the erstwhile MCI has aligned and integrated the basic knowledge of pre and Para Clinical Subject with the clinical Subjects. Earlier clinical exposure, AETCOM module, Problem based learning, Domain wise education and exposure, developing interest in basic research is likely to bring a positive impact and enhancement in job opportunities to these young graduates.

3. All Registrars of the University and the Deans/Principals of the medical college are requested to complete the required formalities with regard to amalgamation of old and new batch of MBBS students in the new CBME Course Curriculum on priority.


(Dr. Aruna V. Vanikar)
President

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राष्ट्रीय आयुर्विज्ञान आयोग
National Medical Commission
(Undergraduate Medical Education Board)

No.U.14021-8-2023-UGMEB/

Dated the 12th June 2023

CIRCULAR

Subject : Guidelines under Graduate Medical Education Regulation 2023

Consequent upon publication of Graduate Medical Education Regulations 2023 in Gazette of India vide Notification dated 2nd June 2023 and in suppression of Graduate Medical Education Regulations 1997(as amended), Under Graduate Medical Education Board(UGMEB) hereby issues following new Guidelines for the MBBS Course :

- (i) CBME Curriculum
 - (ii) Manpower Requirement for Research Facilities in a Medical College.
 - (iii) Family Adoption Program
 - (iv) Admission of students under "Disability Category" in MBBS Course.
 - (v) Format for submission of information regarding admission of in a medical college
2. All previously issued Notifications/circulars/clarifications shall now be void and superseded by these new guidelines.
 3. These new guidelines shall be applicable to all the admission made in MBBS Course in a medical college in the academic year 2023-24.
 4. This issues with the approval of the competent authority in UGMEB, National Medical Commission.


12/6/2023
(Shambhu Sharan Kumar)
Director, UGMEB

CBME CURRICULUM

1. Preamble

The new Graduate Medical Education Regulations attempts to stand on the shoulder of the contributions and the efforts of resource persons, teachers and students (past and present). It intends to take the learner to provide health care to the evolving needs of the nation and the world.

About 25 years have passed since the existing Regulations on Graduate Medical Education, 1997 were notified, necessitating a relook at all aspects of the various components in the existing regulations and adapt them to the changing demography, socio-economic context, perceptions, values, advancements in medical education and expectations of stakeholders. Emerging health care issues particularly in the context of emerging diseases, impact of advances in science and technology and shorter distances on diseases and their management also need consideration. The strong and forward-looking fundamentals enshrined in the Regulations on Graduate Medical Education, 1997 has made this job easier. A comparison between the 1997 Regulations and proposed Graduate Medical Education Regulations, 2019 will reveal that the 2019 Regulations have evolved from several key principles enshrined in the 1997 Regulations.

The thrust in the new regulations is continuation and evolution of thought in medical education making it more learner-centric, patient-centric, gender- sensitive, outcome -oriented and environment appropriate. The result is an outcome driven curriculum which conforms to global trends. Emphasis is made on alignment and integration of subjects both horizontally and vertically while respecting the strengths and necessity of subject-based instruction and assessment. This has necessitated a deviation from using “broad competencies”; instead, the reports have written end of phase subject (sub) competencies. These “sub-competencies” can be mapped to the global competencies in the Graduate Medical Education Regulations.

The importance of ethical values, responsiveness to the needs of the patient and acquisition of communication skills is underscored by providing dedicated curriculum time in the form of a longitudinal program based on Attitude, Ethics and Communication (AETCOM) competencies. Great emphasis has been placed on collaborative and inter-disciplinary teamwork, professionalism, altruism and respect in professional relationships with due sensitivity to differences in thought, social and economic position and gender.

2. Objectives of the Indian Graduate Medical Training Programme

The undergraduate medical education program is designed with a goal to create an “Indian Medical Graduate” (IMG) possessing requisite knowledge, skills, attitudes, values and responsiveness, so that she or he may function appropriately and effectively as a Physician of first contact of the community while being globally relevant. To achieve this, the following national and institutional goals for the learner of the Indian Medical Graduate training program are hereby prescribed.



3. National Goals

At the end of undergraduate program, the Indian Medical Graduate should be able to:

- a. Recognize "health for all" as a national goal and health right of all citizens and by undergoing training for medical profession fulfill his social obligations towards realization of this goal.
- b. Learn key aspects of National policies on health and devote himself to its practical implementation.
- c. Achieve competence in practice of holistic medicine, encompassing promotive, preventive, curative and rehabilitative aspects of common diseases.
- d. Develop scientific temper, acquire educational experience for proficiency in profession and promote healthy living.
- e. Become exemplary citizen by observance of medical ethics and fulfilling social and professional obligations, so as to respond to national aspirations.

4. Institutional Goals

In consonance with the national goals, each medical institution should evolve institutional goals to define the kind of trained manpower (or professionals) they intend to produce. The Indian Medical Graduates coming out of a medical institute should:

- a. Be competent in diagnosis and management of common health problems of the individual and the community, commensurate with his/her position as a member of the health team at the primary, secondary or tertiary levels, using his/her clinical skills based on history, physical examination and relevant investigations.
- b. Be competent to practice preventive, promotive, curative, palliative and rehabilitative medicine in respect to the commonly encountered health problems.
- c. Appreciate rationale for different therapeutic modalities; be familiar with the administration of the "essential drugs" and their common side effects.
- d. Appreciate the socio-psychological, cultural, economic and environmental factors affecting health and develop humane attitude towards the patients in discharging one's professional responsibilities.
- e. Possess the attitude for continued self-learning and to seek further expertise or to pursue research in any chosen area of medicine, action research and documentation skills.



- f. Be familiar with the basic factors which are essential for the implementation of the National Health Programs including practical aspects of the following:
 - i) Family Welfare and Maternal and Child Health (MCH);
 - ii) Sanitation and water supply;
 - iii) Prevention and control of communicable and non-communicable diseases;
 - iv) Immunization;
 - v) Health Education and advocacy;
 - vi) Indian Public Health Standards (IPHS) at various level of service delivery;
 - vii) Bio-medical waste disposal
 - viii) Organizational and or institutional arrangements.
- g. Acquire basic management skills in the area of human resources, materials and resource management related to health care delivery, general and hospital management, principal inventory skills and counseling.
- h. Be able to identify community health problems and learn to work to resolve these by designing, instituting corrective steps and evaluating outcome of such measures with maximum community participation.
- i. Be able to work as a leading partner in health care teams and acquire proficiency in communication skills.
- j. Be competent to work in a variety of health care settings.
- k. Have personal characteristics and attitudes required for professional life including personal integrity, sense of responsibility and dependability and ability to relate to or show concern for other individuals.

5. Goals for the Learner

In order to fulfill these goals, the Indian Medical Graduate must be able to function in the following roles appropriately and effectively:-

- a. Clinician who understands and provides preventive, promotive, curative, palliative and holistic care with compassion.
- b. Leader and member of the health care team and system with capabilities to collect, analyze, synthesize and communicate health data appropriately.
- c. Communicator with patients, families, colleagues and community.

- d. Lifelong learner committed to continuous improvement of skills and knowledge.
- e. Professional, who is committed to excellence, is ethical, responsive and accountable to patients, community and profession.
- f. Critical thinker who demonstrates problem solving skills in professional practice
- g. Researcher who generates and interprets evidence

6. Competency Based Training Programme of the Indian Medical Graduate

Competency based learning would include designing and implementing medical education curriculum that focuses on the desired and observable ability in real life situations. In order to effectively fulfill the roles, the Indian Medical Graduate would have obtained the following set of competencies at the time of graduation:

Clinician, who understands and provides preventive, promotive, curative, palliative and holistic care with compassion

- Demonstrate knowledge of normal human structure, function and development from a molecular, cellular, biologic, clinical, behavioral and social perspective.
- Demonstrate knowledge of abnormal human structure, function and development from a molecular, cellular, biological, clinical, behavioral and social perspective.
- Demonstrate knowledge of medico-legal, societal, ethical and humanitarian principles that influence healthcare.
- Demonstrate knowledge of national and regional health care policies including the National Health Mission that incorporates National Rural Health Mission (NRHM) and National Urban Health Mission (NUHM), frameworks, economics and systems that influence health promotion, health care delivery, disease prevention, effectiveness, responsiveness, quality and patient safety.
- Demonstrate ability to elicit and record from the patient, and other relevant sources including relatives and caregivers, a history that is complete and relevant to disease identification, disease prevention and health promotion.
- Demonstrate ability to elicit and record from the patient, and other relevant sources including relatives and caregivers, a history that is contextual to gender, age, vulnerability, social and economic status, patient preferences, beliefs and values.
- Demonstrate ability to perform a physical examination that is complete and relevant to disease identification, disease prevention and health promotion.
- Demonstrate ability to perform a physical examination that is contextual to gender, social and economic status, patient preferences and values.
- Demonstrate effective clinical problem solving, judgment and ability to interpret and integrate available data in order to address patient problems, generate differential diagnoses and develop individualized management plans that include preventive, promotive and therapeutic goals.
- Maintain accurate, clear and appropriate record of the patient in conformation with

legal and administrative frameworks.

- Demonstrate ability to choose the appropriate diagnostic tests and interpret these tests based on scientific validity, cost effectiveness and clinical context.
- Demonstrate ability to prescribe and safely administer appropriate therapies including nutritional interventions, pharmacotherapy and interventions based on the principles of rational drug therapy, scientific validity, evidence and cost that conform to established national and regional health programmers and policies for the following:
 - Disease prevention,
 - Health promotion and cure,
 - Pain and distress alleviation, and
 - Rehabilitation and palliation.
- Demonstrate ability to provide a continuum of care at the primary (including home care) and/or secondary level that addresses chronicity, mental and physical disability.
- Demonstrate ability to appropriately identify and refer patients who may require specialized or advanced tertiary care.
- Demonstrate familiarity with basic, clinical and translational research as it applies to the care of the patient.

Leader and member of the health care team and system

- Work effectively and appropriately with colleagues in an inter-professional health care team respecting diversity of roles, responsibilities and competencies of other professionals.
- Recognize and function effectively, responsibly and appropriately as a health care team leader in primary and secondary health care settings.
- Educate and motivate other members of the team and work in a collaborative and collegial fashion that will help maximize the health care delivery potential of the team.
- Access and utilize components of the health care system and health delivery in a manner that is appropriate, cost effective, fair and in compliance with the national health care priorities and policies, as well as be able to collect, analyze and utilize health data.
- Participate appropriately and effectively in measures that will advance quality of health care and patient safety within the health care system.
- Recognize and advocate health promotion, disease prevention and health care quality improvement through prevention and early recognition: in a) life style diseases and b) cancer, in collaboration with other members of the health care team.

Communicator with patients, families, colleagues and community

- Demonstrate ability to communicate adequately, sensitively, effectively and respectfully with patients in a language that the patient understands and in a manner that will improve patient satisfaction and health care outcomes.
- Demonstrate ability to establish professional relationships with patients and families that are positive, understanding, humane, ethical, empathetic, and trustworthy.



- Demonstrate ability to communicate with patients in a manner respectful of patient's preferences, values, prior experience, beliefs, confidentiality and privacy.
- Demonstrate ability to communicate with patients, colleagues and families in a manner that encourages participation and shared decision- making.

7. Lifelong learner committed to continuous improvement of skills and knowledge

- Demonstrate ability to perform an objective self-assessment of knowledge and skills, continue learning, refine existing skills and acquire new skills.
- Demonstrate ability to apply newly gained knowledge or skills to the care of the patient.
- Demonstrate ability to introspect and utilize experiences, to enhance personal and professional growth and learning.
- Demonstrate ability to search (including through electronic means), and critically re-evaluate the medical literature and apply the information in the care of the patient.
- Be able to identify and select an appropriate career pathway that is professionally rewarding and personally fulfilling.

Professional who is committed to excellence, is ethical, responsive and accountable to patients, community and the profession

- Practice selflessness, integrity, responsibility, accountability and respect.
- Respect and maintain professional boundaries between patients, colleagues and society.
- Demonstrate ability to recognize and manage ethical and professional conflicts.
- Abide by prescribed ethical and legal codes of conduct and practice.
- Demonstrate a commitment to the growth of the medical profession as a whole.

A. CURRICULUM

➤ **1st Professional Year:**

1. ANATOMY

a. Competencies:

The undergraduate must demonstrate:

- Understanding of the gross and microscopic structure and development of human body,
- Comprehension of the normal regulation and integration of the functions of the organs and systems on basis of the structure and genetic pattern,
- Understanding of the clinical correlation of the organs and structures involved and interpret the anatomical basis of the disease presentations.

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b. Broad subject specific objectives

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

- Comprehend the normal disposition, clinically relevant interrelationships, functional and cross -sectional Anatomy of the various organs and structures of the body.
- Identify the microscopic structure and correlate elementary ultra structure of various organs and tissues 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 analyze the integrative and regulative functions of the organs and systems. He should be able to locate the site of gross lesions according to the deficits encountered
- Demonstrate knowledge of the basic principles and sequential development of the organs and systems; recognize the critical stages of development and the effects of common teratogens, genetic mutations and environmental hazards. He should be able to explain the developmental basis of the major variations and abnormalities.

c. Skills:

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

- Identify and locate all the structures of the body and mark the topography of the Living Anatomy.
- Understand clinical basis of some common clinical procedures i.e. intramuscular and intravenous injection, lumbar puncture and kidney biopsy etc.
- Identify the organs and tissues under the microscope.
- Understand the principles of karyotyping and identify the gross congenital anomalies.
- Understand principles of newer imaging techniques and interpretation of CT scan, sonogram, MRI & Angiography.

- d. Integration:** The teaching should be aligned and integrated horizontally and vertically in organ systems with clinical correlation that will provide a context for the learner to understand the relationship between structure and function and interpret the anatomical basis of various clinical conditions and procedures.

2. PHYSIOLOGY

a. Competencies: The undergraduates must demonstrate:

- Understanding of the normal functioning of the organs and organ systems of the body,
- Comprehension of the normal structure and organization of the organs and systems on basis of the functions,
- Understanding of age-related physiological changes in the organ functions that reflect normal growth and development,



- Understand the physiological basis of diseases.

b. Broad subject specific objectives

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

- Describe the normal functions of all the systems, the regulatory mechanisms and interactions of the various systems for well coordinated total body functions.
- Understanding the relative contribution of each organ system in the maintenance of the milieu interior (homeostasis)
- Explain the physiological aspects of the normal growth and development.
- Analyze the physiological responses and adaptation to environmental stress. Comprehend the physiological principles underlying pathogenesis and treatment of disease.
- Correlate knowledge of physiology of human reproductive system in relation to National Family welfare program.

c. Skills : At the end of the course the student shall be able to:

- Conduct experiments designed for study of physiological phenomenon.
- Interpret experimental /investigative data.
- Distinguish between normal and abnormal data derived as a result of clinical examination and tests, which he has performed and observed in the laboratory.
- Recognize and get familiar with newer computerized and advanced instruments like medspiror, semen quality analyzer, EMG and TMT

d. Integration: The teaching should be aligned and integrated horizontally and vertically in organ systems in order to provide a context in which normal function can be correlated both with structure and with the biological basis, its clinical features, diagnosis and therapy.

3. BIOCHEMISTRY

a. Competencies: The learner must demonstrate an understanding of:

- Biochemical and molecular processes involved in health and disease,
- Importance of nutrition in health and disease,
- Biochemical basis and rationale of clinical laboratory tests, and demonstrate ability to interpret these in the clinical context.

b. Broad subject specific objectives:

Knowledge: At the end of the course, the student shall be able to

- Enlist and describe the cell organelles with their molecular and functional organization.
- Delineate structure, function and interrelationships of various biomolecules and consequences of deviation from the normal.
- Understand basic enzymology and emphasize on its clinical applications wherein regulation of enzymatic activity is disturbed.
- Describe digestion and assimilation of nutrients and consequences of malnutrition.
- Describe and integrate metabolic pathways of various biomolecules with their regulatory mechanisms.
- Explain the biochemical basis of inherited disorders with their associated sequelae.
- Describe mechanisms involved in maintenance of water, electrolyte and acid base balance and consequences of their imbalances.
- Outline the molecular mechanisms of gene expression and regulation, basic principles of biotechnology and their applications in medicine.

c. **Skills :** At the end of the course, the student shall be able to:

- Make use of conventional techniques / instruments to perform biochemical analysis relevant to clinical screening and diagnosis;
- Analyse and interpret investigative data;
- Demonstrate the skills of solving scientific and clinical problems and decision making.

d. **Integration:** The teaching/learning programme should be integrated horizontally and vertically, as much as possible, to enable learners to make clinical correlations and to acquire an understanding of the cellular and molecular basis of health and disease.

2nd Professional Year:

4. PATHOLOGY

a. **Competencies:** The undergraduate must demonstrate:

- Comprehension of the causes, evolution and mechanisms of diseases,
- Knowledge of alterations in gross and cellular morphology of organs in disease states,
- Ability to correlate the natural history, structural and functional changes with the clinical manifestations of diseases, their diagnosis and therapy.

b. **Broad subject specific objectives**

Knowledge: At the end of one and half years, the student shall be able to:

- Describe the structure and ultra structure of a sick cell, causes and mechanisms of cell injury, cell death and repair.
- Correlate structural and functional alterations in the sick cell.
- Explain the pathophysiological processes, which govern the maintenance of

homeostasis, mechanisms of their disturbance and the morphological and clinical manifestation associated with it.

- Describe the mechanisms and patterns of tissue response to injury so as to appreciate the path physiology of disease processes and their application to clinical science.
- Correlate the gross and microscopic alterations of different organ systems in common disease to the extent needed for understanding disease processes and their clinical significance.
- Develop an understanding of steps in neoplastic changes in the body and their effects in order to appreciate need for early diagnosis and further management of neoplasia.
- Understand mechanisms of common hematological disorders and develop a logical approach in their diagnosis and management.
- Develop understanding of the blood banking, blood donors & transfusion of blood & blood products, (components).
- Understand pathophysiology of infectious diseases in relation with tissue changes.
- Describe the various immunological reactions in understanding the disease process & tissue transplant.
- Develop an understanding for genetic disorders.
- Understand the vital organ function test of Kidney, liver & thyroid.

c. Skills : At the end of one and half years, the student shall be able to:

- Describe the rationale and principles of routine technical procedures of the diagnostic laboratory tests & perform it.
- Interpret routine diagnostic laboratory tests and correlate with clinical, hematological and morphological changes.
- Perform the simple bed-side tests on blood, urine and other biological fluid samples:
- Draw a rational scheme of investigations aimed at diagnosing and managing the cases of common disorders.
- Able to understand the microscopic and macroscopic features of common diseases.
- Develop different type of skills such as observation skills, communication skill and presentation skill.
- Understand biochemical/physiological disturbances that occur as a result of disease in collaboration with preclinical department.

d. Integration: The teaching should be aligned and integrated horizontally and vertically in organ systems recognizing deviations from normal structure and function and clinically correlated so as to provide an overall understanding of the etiology, mechanisms, laboratory diagnosis, and management of diseases.



5. MICROBIOLOGY

a. Competencies: The undergraduate learner demonstrates:

- Understanding of role of microbial agents in health and disease,
- Understanding of the immunological mechanisms in health and disease,
- Ability to correlate the natural history, mechanisms and clinical manifestations of infectious diseases as they relate to the properties of microbial agents,
- Knowledge of the principles and application of infection control measures,
- An understanding of the basis of choice of laboratory diagnostic tests and their interpretation, antimicrobial therapy, control and prevention of infectious diseases.
- Knowledge of outbreak investigation and its control.

b. Broad subject specific objectives : At the end of the course the student will be able to :

- Explain how the different microorganisms can cause human infection.
- Understand commercial, opportunistic and pathogenic organisms and describe host parasite relationship.
- Describe the characteristics (morphology, cultural characteristics, resistance, virulence factors, incubation period, mode of transmission etc.) of different microorganisms.
- Explain the various defense mechanisms of the host against the microorganisms which can cause human infection.
- Describe the laboratory diagnosis of microorganisms causing human infections and disease.
- Describe the prophylaxis for the particular infecting microorganisms

c. Skills : At the end of the course the student shall be able to

- Plan the laboratory investigations for the diagnosis of infectious diseases.
- Perform laboratory procedures to arrive at the etiological diagnosis of infectious diseases caused by bacteria, fungi, viruses and parasites including the drug sensitivity profile.
- Perform and interpret immunological and serological tests.
- Operate routine and sophisticated instruments in the laboratory.
- Develop microteaching skills and Pedagogy
- Successfully implement the chosen research methodology

d. Integration: The teaching should be aligned and integrated horizontally and vertically in organ systems with emphasis on host-microbe-environment interactions and their alterations in disease and clinical correlations so as to provide an overall understanding of the etiological agents, their laboratory diagnosis and prevention.



6. PHARMACOLOGY

a. Competencies: The undergraduate must demonstrate:

- Knowledge about essential and commonly used drugs and an understanding of the pharmacologic basis of therapeutics,
- Ability to select and prescribe medicines based on clinical condition and the pharmacologic properties, efficacy, safety, suitability and cost of medicines for common clinical conditions of national importance,
- Knowledge of pharmacovigilance, essential medicine concept and sources of drug information and industry-doctor relationship,
- Ability to counsel patients regarding appropriate use of prescribed drug and drug delivery systems.

b. Broad subject specific objectives :

Knowledge: At the end of the course, the student shall be able to

- Describe the Pharmacokinetics and Pharmacodynamics of essential and commonly used drugs.
- Enlist the indications, contraindications, interactions and adverse reactions of commonly used drugs.
- Tailor the use of appropriate drugs in disease with consideration of its cost, efficacy and safety for individual needs and Mass therapy, under National Health Programs.
- Integrate the list of drugs of addiction and recommend the management of drug addiction.
- Explain pharmacological basis of prescribing drugs in special medical situations such as pregnancy, lactation, infancy, old age, renal damage, hepatic damage and immuno-compromised patients.
- Explain the concept of rational drug therapy in clinical pharmacology.
- State the principles underlying the concept of 'Essential Drugs'.
- Evaluate the ethics and modalities involved in the development and introduction of new drugs.

c. Skills : At the end of the course, the student shall be able to

- Prescribe drugs for common ailments.
- Identify adverse reactions and drug interactions of commonly used drugs.
- Interpret the data obtained from the experiments designed for the study of effect of drugs in various experimental and clinical studies.
- Analyze the information regarding common pharmaceutical preparations and critically evaluate drug formulations.
- Appraise the Principles of Clinical Pharmacy and Dispense the Medications giving



proper instructions.

- d. **Integration:** Practical knowledge of use of drugs in Clinical Practice will be acquired through Integrated Teaching vertically with Preclinical and Clinical subjects and horizontally with other Para clinical subjects.

3rd PROFESSIONAL YEAR

7. FORENSIC MEDICINE AND TOXICOLOGY

a. **Competencies :** The learner must demonstrate:

- Understanding of medico-legal responsibilities of Physicians in primary and secondary care settings,
- Understanding of the rational approach to the investigation of crime, based on scientific and legal principles,
- Ability to manage medical and legal issues in cases of poisoning /overdose,
- Understanding the medico-legal framework of medical practice and medical negligence,
- Understanding of codes of conduct and medical ethics.

b. **Broad subject specific objectives:**

Knowledge: At the end of the course, the student shall be able to

- Identify the basic Medico-legal aspects of hospital and general practice.
- Define the Medico-legal responsibilities of a general Physician while rendering community service either in a rural primary health centre or an urban health centre.
- Appreciate the Physician's responsibilities in criminal matters and respect for the codes of Medical ethics.
- Diagnose, manage and identify legal aspect of common acute and chronic poisonings.
- Describe the Medico-legal aspects and findings of post-mortem examination in cases of death due to common unnatural conditions and poisonings.
- Detect occupational and environmental poisoning, prevention and epidemiology of common poisoning and their legal aspects particularly pertaining to Workmen's Compensation Act.
- Describe the general principles of analytical toxicology.

c. **Skills :** At the end of the course, the student shall be able to :

- As recommended by Medical Council of India Regulation, 1997 desirable for Bachelor of Medicine and Bachelor of Surgery (MBBS) Graduate for Forensic Medicine and Toxicology.
- Make observations and draw logical inferences in order to initiate enquiries in criminal



- matters and Medico-legal problems and be able to -
 - Carry on proper Medico-legal examination and documentation/Reporting of Injury and Age.
 - Conduct examination for sexual offences and intoxication.
 - Preserve relevant ancillary materials for medico-legal examination.
 - Identify important post-mortem findings in common unnatural deaths.
 - Diagnose and treat common emergencies in poisoning and chronic toxicity.
 - Make observations and interpret findings at post-mortem examination.
 - Observe the principles of medical ethics in the practice of his profession.
- d. **Integration:** The teaching should be aligned and integrated horizontally and vertically recognizing the importance of medico-legal, ethical and toxicological issues as they relate to the practice of medicine.

8. COMMUNITY MEDICINE

a. **Competencies:** The undergraduate must demonstrate :

- Understanding of the concept of health and disease,
- Understanding of demography, population dynamics and disease burden in National and global context,
- Comprehension of principles of health economics and hospital management,
- Understanding of interventions to promote health and prevent diseases as envisioned in National and State Health Programmes.
- Understanding of physical, social, psychological, economic and environmental determinants of health and disease,
- Ability to recognize and manage common health problems including physical, emotional and social aspects at individual family and community level in the context of National Health Programmes,
- Ability to Implement and monitor National Health Programmes in the primary care setting,
- Knowledge of maternal and child wellness as they apply to national health care priorities and programmes,
- Ability to recognize, investigate, report, plan and manage community health problems including malnutrition and emergencies.

b. **Broad subject specific objectives:**

Knowledge: At the end of the course the student shall be able

- Explain the principles of sociology including demographic population dynamics.
- Identify social factors related to health, disease and disability in the context of urban and rural societies.

- Appreciate the impact of urbanization on health and disease.
- Observe and interpret the dynamic of community behaviors.
- Describe the elements of normal psychology and social psychology.
- Observe the principles of practice of medicine in hospital and community settings.
- Describe the health care delivery systems including rehabilitation of the disabled in the country.
- Describe the National Health Programmes with particular emphasis on maternal and child health programmes, family welfare planning and population control.
- Describe the epidemiological methods and techniques.
- Outline the demographic pattern of the country and appreciate the roles of the individuals, family, community and socio-cultural milieu in health and disease.
- Describe the health information systems.
- Acquire, understand, integrate, apply and manage information in context to health care problems and health care delivery system in various communities, health care settings and hospitals.
- Describe the principles and components of primary health care, National Rural Health Mission and the national health policies to achieve the goal of "Health for all" with regards to identify the environmental, bio-waste and occupational hazards and their control.
- Describe the importance of water and sanitation in human health.
- Describe the principles of health economics, health administration, health education in relation to community.
- Critically analyze the problem (s) and apply his/her knowledge to solve the problem in holistic manner.
- Describe and apply principles of prevention, promotion and maintenance of health.

c. Skills : At the end of the course, the student shall be able to :

- Use the principles and practice of medicine in hospital and community settings and familiarization with elementary practices.
- Use the Art of communication with patients including history taking and medico social work.
- Use epidemiology as a scientific tool to make rational decisions relevant to community and individual patient intervention.
- Organize health care services for vulnerable and disadvantages groups.
- Organize health care services in case of calamities.
- Collect, analyze, interpret and present simple community and hospital base data.
- Diagnose and manage common health problems (including communicable and non-communicable diseases) and emergencies at the individual, family and community levels keeping in mind the existing health care resources and in the context of the prevailing socio-culture beliefs.
- Diagnose and manage common nutritional problems at the individual and community

level.

- Plan, implement and evaluate a health education Programme with skill to use simple audio-visual aids.
- Interact with other members of the health care team and participate in the organization of health care services, health advocacy and implementation of national health programmes.
- Perform Administrative functions at health centers
- Observe the principles of medical ethics in the practice of his profession.

- d. **Integration:** Department shall adopt an integrated approach towards other clinical disciplines, public health services, NGOs, environmental sciences, social sciences, management, hospital administration, research, etc. to impart training to enable the graduate to work at all levels of health care. The teaching should be aligned and integrated horizontally and vertically in order to allow the learner to understand the impact of environment, society and national health priorities as they relate to the promotion of health and prevention and cure of disease.

9. GENERAL MEDICINE

a. **Competencies:** The student must demonstrate ability to do the following in relation to common medical problems of the adult in the community:

- Demonstrate understanding of the pathophysiologic basis, epidemiological profile, signs and symptoms of disease and their investigation and management,
- Competently interview and examine an adult patient and make a clinical diagnosis,
- Appropriately order and interpret laboratory tests,
- Initiate appropriate cost-effective treatment based on an understanding of the rational drug prescriptions, medical interventions required and preventive measures,
- Follow up of patients with medical problems and refer whenever required,
- Communicate effectively, educate and counsel the patient and family,
- Manage common medical emergencies and refer when required,
- Independently perform common medical procedures safely and understand patient safety issues.

b. **Broad subject specific objectives:**

Knowledge: At the end of the course, the student shall be able to:

- Diagnose common clinical disorders with special reference to infectious diseases, nutritional disorders, tropical and environmental diseases;



- Outline various modes of management including drug therapeutics especially dosage, side effects, toxicity, interactions, indications and contra-indications;
- Propose diagnostic and investigative procedures and ability to interpret them;
- Provide first level management of acute emergencies promptly and efficiently and decide the timing and level of referral, if required;
- Recognize geriatric disorders and their management.

c. Skills : At the end of the course, the student shall be able to :

- Develop clinical skills (history taking, clinical examination and other instruments of examination) to diagnose various common medical disorders and emergencies;
- Refer a patient to secondary and/or tertiary level of health care after having instituted primary care;
- Perform simple routine investigations like hemogram, stool, urine, sputum and biological fluid examinations;
- Assist the common bedside investigative procedure like pleural tap, Lumbar puncture, bone marrow aspiration/biopsy and liver biopsy.

d. Integration: The teaching should be aligned and integrated horizontally and vertically in order to provide sound biologic basis and incorporating the principles of general medicine into a holistic and comprehensive approach to the care of the patient. With other relevant academic inputs which provide scientific basis of clinical medicine e.g. anatomy, physiology, biochemistry, microbiology, pathology and pharmacology.

10. DERMATOLOGY

a. Competencies: The undergraduate student must demonstrate:

- Understanding of the principles of diagnosis of diseases of the skin, hair, nail and mucosa,
- Ability to recognize, diagnose, order appropriate investigations and treat common diseases of the skin including leprosy in the primary care setting and refer as appropriate,
- A syndromic approach to the recognition, diagnosis, prevention, counseling, testing and management of common sexually transmitted diseases including HIV based on national health priorities,
- Ability to recognize and treat emergencies including drug reactions and refer as appropriate.

b. Broad subject specific objectives:

Knowledge: At the end of the course of Dermatology the student shall be able to :

- Demonstrate sound knowledge of common diseases, their clinical manifestations,

including emergent situations and of investigative procedures to confirm their diagnosis

- Demonstrate comprehensive knowledge of various modes of therapy used in treatment of cutaneous, sexually transmitted diseases and leprosy
- Describe the mode of action of commonly used drugs, their doses, side effects/toxicity, indications and contra-indications and interactions
- Describe commonly used modes of management including the medical and surgical procedures available for the treatment of various diseases and to offer a comprehensive plan of management for a given disorder

c. Skills: The student shall be able to :

- Interview the patient, elicit relevant and correct information and describe the history in a chronological order:
- Conduct clinical examination, elicit and interpret physical findings and diagnose common disorders and emergencies.
- Demonstrate simple, routine investigative and laboratory procedures required for making the bed-side diagnosis, especially the examination of scrapings for fungus, preparation of slit smears and staining for AFB for leprosy patients and for STD cases and take a skin biopsy for diagnostic purposes.
- Manage common diseases and recognizing the need for referral for specialized care, in case of inappropriateness of therapeutic response.

d. Integration: The teaching should be aligned and integrated horizontally and vertically in order to emphasize the biologic basis of diseases of the skin, sexually transmitted diseases and leprosy

11. PSYCHIATRY

a. Competencies: The student must demonstrate:

- Ability to promote mental health and mental hygiene,
- Knowledge of etiology (bio-psycho-social-environmental interactions), clinical features, diagnosis and management of common psychiatric disorders across all ages,
- Ability to recognize and manage common psychological and psychiatric disorders in a primary care setting, institute preliminary treatment in disorders difficult to manage, and refer appropriately,
- Ability to recognize alcohol/ substance abuse disorders and refer them to appropriate centers,
- Ability to assess risk for suicide and refer appropriately,
- Ability to recognize temperamental difficulties and personality disorders,
- Assess mental disability and rehabilitate appropriately,



- Understanding of National and State programmes that address mental health and welfare of patients and community.

b. Broad subject specific objectives:

Knowledge: At the end of the course the student shall be able to:

- Understand the comprehensive nature & development of different aspects of normal human behavior like learning, memory, motivation, personality & intelligence
- Recognize differences between normal & abnormal behavior
- Classify psychiatric disorders
- Recognize clinical manifestations of the following common syndromes & plan their appropriate management of organic psychosis, functional psychosis, schizophrenia, affective disorders, neurotic disorders, personality disorders, psycho physiological disorders, drug & alcohol dependence, psychiatric disorders of childhood & adolescence
- Describe rational use of different mode of therapy in psychiatric disorders.

c. Skills: The student shall be able to:

- Interview the patient & understand different methods of communications in patient-doctor relationship
- Elicit detailed psychiatric case history & conduct clinical examination for assessment of mental status
- Define, elicit & interpret psychopathological symptoms & signs
- Diagnose & manage common psychiatric disorders
- Identify & manage common psychological reactions & psychiatric disorders in medical & surgical patients in clinical practice & in community setting

d. Integration: The teaching should be aligned and integrated horizontally and vertically in order to allow the student to understand bio-psycho-social-environmental interactions that lead to diseases/ disorders for preventive, promotive, curative, rehabilitative services and medico-legal implications in the care of patients both in family and community.

12. RESPIRATORY MEDICINE

a. Competencies: The student must demonstrate:

- Knowledge of common chest diseases, their clinical manifestations, diagnosis and management,
- Ability to recognize, diagnose and manage pulmonary tuberculosis as contemplated in National Tuberculosis Elimination programme.

- Ability to manage common respiratory emergencies in primary care setting and refer appropriately.

b. Broad subject specific objectives:

Knowledge: At the end of the course of Pulmonary Medicine, the student shall be able to:

- Demonstrate sound knowledge of common chest diseases, their manifestations, including emergency situations and of investigative procedures to confirm their diagnosis.
- Demonstrate comprehensive knowledge of various modes of therapy used in treatment of respiratory diseases.
- Describe the modes of action of commonly used drugs, their doses, side effects/toxicity, indications and contra indications and interactions.
- Describe commonly used modes of management including medical and surgical procedures available for treatment of various diseases and to offer a comprehensive plan of management inclusive of Revised National Tuberculosis Control programme.

c. Skills : The student shall be able to :

- Interview the patient, elicit relevant and correct information and describe the history in chronological order;
- Conduct clinical examination, elicit and interpret clinical findings and diagnose common respiratory disorders and emergencies;
- Perform simple, routine investigative and office procedures required for making the bed side diagnosis especially sputum collection and examination for etiologic organisms especially Acid fast Bacilli (AFB), interpretation of the chest x-rays and respiratory function tests;
- Interpret and manage various blood gases and PH abnormalities in various respiratory diseases;
- Manage common diseases recognizing need for referral for specialized care, in case of inappropriateness of therapeutic responses;
- Assist in the performance of common procedures. like laryngoscopic examination, pleural aspiration, respiratory physiotherapy, laryngeal intubation and pneumothoracic drainage/aspiration

- d. **Integration:** The teaching should be aligned and integrated horizontally and vertically in order to allow the student to recognize diagnose and treat TB and other lung diseases in the context of the society, national health priorities, drug resistance and co-morbid conditions like HIV.

13. PEDIATRICS

a. Competencies: The student must demonstrate:

- Ability to assess and promote optimal growth, development and nutrition of children and adolescents and identify deviations from normal,
- Ability to recognize and provide emergency and routine ambulatory and First Level Referral Unit care for neonates, infants, children and adolescents and refer as may be appropriate,
- Ability to perform procedures as indicated for children of all ages in the primary care setting,
- Ability to recognize children with special needs and refer appropriately,
- Ability to promote health and prevent diseases in children,
- Ability to participate in National Programmes related to child health and in conformation with the Integrated Management of Neonatal and Childhood Illnesses (IMNCI) Strategy,
- Ability to communicate appropriately and effectively.

b. Broad subject specific objectives:

Knowledge:-At the end of the course, the students shall be able to:-

- Describe the normal Growth and Development during fetal life, Neonatal period, Childhood and Adolescence and the deviations thereof.
- Describe the common Pediatric disorders and emergencies in terms of Epidemiology, Etiopathogenesis, Clinical manifestations, Diagnosis and also describe the rational therapy and rehabilitation services.
- Workout age related requirements of calories, nutrients, fluids, dosages of drugs etc. in health and disease.
- Describe preventive strategies for common infectious disorders, Malnutrition, Genetic and Metabolic disorders, Poisonings, Accidents and Child abuse.
- Outline national programs related to child health including Immunization programs.

c. Skills : At the end of the course, the students shall be able to:-

- Take detailed Pediatric and Neonatal history and conduct an appropriate physical examination of children and neonates, make clinical diagnosis, conduct common bedside investigative procedures, interpret common laboratory investigations, plan and institute therapy.
- Take anthropometric measurements, resuscitate newborn, prepare oral rehydration solution, perform tuberculin test, administer vaccines available under current National programs, perform venesection, start intravenous fluids and provide nasogastric feeding.



- Conduct diagnostic procedures such as lumbar puncture, liver and kidney biopsy, bone marrow aspiration, pleural and ascitic tap.
 - Distinguish between normal Newborn babies and those requiring special care and institute early care to all newborn babies including care of preterm and low birth weight babies, provide correct guidance and counseling about breastfeeding and Complementary feeding.
 - Provide ambulatory care to all not so sick children, identify indications for specialized/ inpatient care and ensure timely referral to those who require hospitalization.
- d. **Integration:** The teaching should be aligned and integrated horizontally and vertically in order to provide comprehensive care for neonates, infants, children and adolescents based on a sound knowledge of growth, development, disease and their clinical, social, emotional, psychological correlates in the context of national health priorities.

14. GENERAL SURGERY

a. **Competencies:** The student must demonstrate:

- Understanding of the structural and functional basis, principles of diagnosis and management of common surgical problems in adults and children
- Ability to choose, calculate and administer appropriately intravenous fluids, electrolytes, blood and blood products based on the clinical condition
- Ability to apply the principles of asepsis, sterilization, disinfection, rational use of prophylaxis, therapeutic utilities of antibiotics and universal precautions in surgical practice
- Knowledge of common malignancies in India and their prevention, early detection and therapy
- Ability to perform common diagnostic and surgical procedures at the primary care level
- Ability to recognize, resuscitate, stabilize and provide Basic & Advanced Life Support to patients following trauma
- Ability to administer informed consent and counsel patient prior to surgical procedures,
- Commitment to advancement of quality and patient safety in surgical practice.

b. **Broad subject specific objectives.**

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

- Describe aetiology, pathophysiology, principles of diagnosis and management of common surgical problems including emergencies in adult and children.
- Define indications and methods for fluid and electrolytes replacement therapy

including blood transfusion.

- Define asepsis, disinfection and sterilization and recommend judicious use of antibiotics.
- Describe common malignancies in the country and their management including prevention.
- Enumerate different types of anaesthetic agents, their indications, contraindications, mode of administration, and side effects.

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

- Diagnose common surgical conditions both acute and chronic, in adults and children.
- Plan various laboratory tests for surgical conditions and interpret the results.
- Identify and manage patients of hemorrhagic, septicemia and other types of shock.
- Be able to maintain patent air-way and resuscitate.
- Monitor patient of head, chest, spinal and abdominal injuries, both in adults and children.
- Provide primary care for a patient of burns.
- Acquire principles of operative surgery including preoperative, operative and post operative care and monitoring.
- Treat open wound including preventive measures against tetanus and gas gangrene.
- Diagnose neonatal and pediatric surgical emergencies and provide sound primary care before referring the patient to secondary/tertiary centres.
- Identify congenital anomalies and refer them for appropriate management.

d. Integration: The teaching should be aligned and integrated horizontally and vertically in order to provide a sound biologic basis and a holistic approach to the care of the surgical patient.

- Apply knowledge of basic medical sciences and other relevant subjects to support understanding of various pathologies, facilitate examination of and intervention for the patients.
- To apply the principles of quality of health care, legal and ethical principles and regulations as recommended by Medical Council of India and WHO.

15. ORTHOPAEDICS (INCLUDING PHYSICAL MEDICINE & REHABILITATION)

a. Competencies: The student must demonstrate:

- Ability to recognize and assess bone injuries, dislocation and poly-trauma and provide first contact care prior to appropriate referral.

- Knowledge of the medico-legal aspects of trauma,
- Ability to recognize and manage common infections of bone and joints in the primary care setting,
- Recognize common congenital, metabolic, neoplastic, degenerative and inflammatory bone diseases and refer appropriately,
- Ability to perform simple orthopedic techniques as applicable to a primary care setting,
- Ability to recommend rehabilitative services for common orthopaedic problems across all ages.

b. Broad subject specific objectives

Knowledge: The student shall be able to understand:

- The principles, diagnosis and primary management and be able to give appropriate referral for further definitive management of bones and joint injuries.
- Osteogenesis, manifestation and diagnosis, primary management and give their referral for appropriate correction or rehabilitation of common musculoskeletal disorders including infections of bones and joints; congenital skeletal anomalies, metabolic bone diseases and neoplasm affecting bones.

c. Skills : At the end of the course, the student shall be able to:

- Detect soft tissue injuries such as sprains and strains.
- Detect common fractures of extremities.
- Deliver first aid measures for common fractures and sprains.
- Deliver emergency measures to poly trauma patients.
- Manage uncomplicated fractures of clavicle, forearm, phalanges etc.
- Use techniques of splinting such as application of Thomas splint, plaster slab and casts, immobilization by skin tractions etc.
- Learn indications for closed reductions, open reductions, internal fixation and external fixations of fracture.
- Manage common bone infection; learn indications for sequestration, amputation and corrective measures for bone deformities.
- Advice and counsel patient for rehabilitation for post traumatic, poliomyelitis, cerebral palsy and amputation.
- Be able to perform certain orthopedic skills, provide sound advice of skeletal and related conditions at primary or secondary health care level.

d. Integration: The teaching should be aligned and integrated horizontally and vertically in order to allow the student to understand the structural basis of orthopedic problems, their management and correlation with function, rehabilitation and quality of life.

16. ANAESTHESIOLOGY

a. Competencies: The student must demonstrate ability to:

- Describe and discuss the pre-operative evaluation, assessing fitness for surgery and the modifications in medications in relation to anesthesia /surgery,
- Describe and discuss the roles of Anesthesiologist as a peri-operative Physician including pre-medication, endotracheal intubation, general anesthesia and recovery (including variations in recovery from anesthesia and anaesthetic complications),
- Describe and discuss the management of acute and chronic pain, including labour analgesia,
- Demonstrate awareness about the maintenance of airway in children and adults in various situations,
- Demonstrate the awareness about the indications, selection of cases and execution of cardio- pulmonary
- Resuscitation in emergencies and in the intensive care and high dependency units,
- Choose cases for local / regional anesthesia and demonstrate the ability to administer the same,
- Discuss the implications and obtain informed consent for various procedures and to maintain the documents.

b. Broad subject specific objectives:

Knowledge: At the end of the course, the student shall be able to :

- Know of simple nerve block and pain relief
- Awareness of the principles of administration of general, regional and local anesthesia.
- Know importance of hypoglycemia/hyperglycemia, hypotension/hypertension, IHD, Myocardial infarction.
- Know ventilators.

c. Skills : At the end of the training, the students should be able to:

- Perform cardio-pulmonary resuscitation with the available resources and transfer the patients to a bigger hospital for advanced life support.
- Set up intravenous infusion and manage fluid therapy
- Clear and maintain airway in unconscious patient.
- Administer oxygen correctly

d. Integration: The teaching should be aligned and integrated horizontally and vertically in order to provide comprehensive care for patients undergoing various surgeries, in patients



with pain, in intensive care and in cardio respiratory emergencies. Integration with the preclinical department of Anatomy, para- clinical department of Pharmacology and horizontal integration with any/all surgical specialties is proposed.

17. RADIODIAGNOSIS

a. Competencies: The student must demonstrate:

- Understanding of indications for various radiological investigations in common clinical practice,
- Awareness of the ill effects of radiation and various radiation protective measures to be employed,
- Ability to identify abnormalities in common radiological investigations.

b. Broad subject specific objectives:

Knowledge: At the end of the course, the student shall be able to :

- Enlist and describe the various diagnostic modalities
- Delineate normal and abnormal radiological findings
- Understand basic radiology and emphasize on its clinical applications
- Describe radiographic, ultra sonographic, CT, MRI features of common pathologies.
- Describe and integrate radiological findings in CNS, GIT, RS, CVS, MSK, GUT

c. Skills At the end of the course, the student shall be able to:

- Make use of Imaging findings to reach to a diagnosis;
- Analysis and interpret radiological data;
- Demonstrate the skills of solving clinical problems by illustrative evidences and decision making.

d. Integration: Horizontal and vertical integration to understand the fundamental principles of radiologic imaging, anatomic correlation and their application in diagnosis and therapy

18. OTO-RHINOLARYNGOLOGY (ENT)

a. Competencies: The learner must demonstrate :

- Knowledge of the common Otorhinolaryngological (ENT) emergencies and problems,
- Ability to recognize, diagnose and manage common ENT emergencies and problems in primary care setting,



- Ability to perform simple ENT procedures as applicable in a primary care setting,
- Ability to recognize hearing impairment and refer to the appropriate hearing impairment rehabilitation programme.

b. Broad subject specific objectives:

Knowledge: At the end of the course, the student shall be able to :

- Describe the basic pathophysiology of common Ear, Nose & Throat (ENT) diseases & emergencies.
- Adopt the rational use of commonly used drugs keeping in mind their adverse reactions.
- Suggest common investigative procedures & their interpretation.

c. Skills: At the end of the course the student shall be able to :

- Examination & Diagnose common ENT problems including pre-malignant & Malignant disorders of the Head & Neck.
- Manage ENT problems at first level of care & be able to refer whenever necessary.
- Assist / carry out minor ENT procedures like ear syringing, ear dressing, nasal packing.
- Assist in certain procedures such as tracheotomy, endoscopy & removal of foreign bodies.

d. Integration: The teaching should be aligned and integrated horizontally and vertically in order to allow the learner to understand the structural basis of ENT problems, their management and correlation with function, rehabilitation and quality of life. The undergraduate training ENT will provide an integrated approach towards other disciplines especially, neurosciences, ophthalmology & general surgery.

19. OPHTHALMOLOGY

a. Competencies: The student must demonstrate:

- Knowledge of common eye problems in the community
- Recognize, diagnose and manage common eye problems and identify indications for referral,
- Ability to recognize visual impairment and blindness in the community and implement national programmes as applicable in the primary care setting.

b. Broad subject specific objectives

Knowledge: At the end of the course, student shall have the knowledge of

- Common problems affecting the eye.
- Principles of management of major ophthalmic emergencies.
- Main systemic disease affecting the eye.
- Effects of local and systemic diseases on patient's vision and the necessary action required minimizing the sequelae of such diseases.
- Adverse drug reaction with special reference to ophthalmic manifestations.
- Magnitude of blindness in India and its main causes.
- National programme for control of blindness and its implementation at various levels.
- Eye care education for prevention of eye problems.
- Role of primary health center in organization of eye camps.
- Organization of primary health care and the functioning of the ophthalmic assistant.
- Integration of the national programme for control of blindness with the other national health programmes.
- Eye bank organization.

c. Skills

- Elicit a history pertinent to general health and ocular status.
- Assist in diagnostic procedures such as visual acuity testing, examination of eye, Schiotz tonometry, Staining of Corneal pathology, confrontation, perimetry, Subjective refraction including correction of Presbyopia and aphakia, direct ophthalmoscopy and conjunctival smear examination and Cover test.
- Diagnose and treat common problems affecting the eye.
- Interpret ophthalmic signs in relation to common systemic disorders.
- Assist/observe therapeutic procedures such as Subconjunctival injection, corneal conjunctival foreign body removal, carbolic cautery for corneal ulcers, Nasolacrimal duct syringing and tarsorrhaphy
- Provide first aid in major ophthalmic emergencies.
- Assist to organize community surveys for visual check-up.
- Assist to organize primary eye care service through primary health centers.
- Use effective means of communication with the public and individual to motivate for surgery in cataract and for eye donation.
- Establish rapport with his seniors, colleagues and paramedical workers, so as to effectively function as a member of the eye care team.

- d. **Integration:** The teaching should be aligned and integrated horizontally and vertically in order to allow the student to understand the structural basis of ophthalmologic problems, their management and correlation with function, rehabilitation and quality of life.

20. OBSTETRICS AND GYNAECOLOGY

a. Competencies: The student must demonstrate ability to:

- Provide peri-conceptional counseling and ante natal care,
- Identify high-risk pregnancies and refer appropriately,
- Conduct normal deliveries, using safe delivery practices in the primary and secondary care settings,
- Prescribe drugs safely and appropriately in pregnancy and lactation,
- Diagnose complications of labor, institute primary care and refer in a timely manner,
- Perform early neonatal resuscitation,
- Provide postnatal care, including education in breast-feeding,
- Counsel and support couples in the correct choice of contraception,
- Interpret test results of laboratory and radiological investigations as they apply to the care of the obstetric patient,
- Apply medico-legal principles as they apply to tubectomy, Medical Termination of Pregnancy (MTP), Pre-conception and Prenatal Diagnostic Techniques (PC PNDT Act) and other related Acts.
- Elicit a gynecologic history, perform appropriate physical and pelvic examinations and PAP smear in the primary care setting,
- Recognize, diagnose and manage common reproductive tract infections in the primary care setting,
- Recognize and diagnose common genital cancers and refer them appropriately.

b. Broad subject specific objectives

Knowledge : At the end of the course, the student shall be able to:

- Outline the anatomy, physiology and pathophysiology of the reproductive system and the common conditions affecting it.
- Diagnose normal pregnancy, labour, puerperium and manage the problems he is likely to encounter therein.
- List of leading causes of maternal and perinatal morbidity and mortality.
- Understand the principles of contraception and various techniques employed, methods of medical termination of pregnancy, sterilization and their complications.
- Identify the use, abuse and side effects of drugs in pregnancy, peri- menopausal and post-menopausal periods.
- Describe the national programme of maternal and child health and family welfare and their implementation at various levels.
- Identify common gynecological diseases and describe principles of their management.



- State the indications, techniques and complications of surgeries like Caesarian section, laparotomy, abdominal and vaginal hysterectomy, Fothergill's operation and vacuum
- Aspiration for Medical Termination of pregnancy (MTP) and minor surgeries like EB, D and C, Cervical Biopsy and Cervical encircage.

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

- Take proper history and writing a good case sheet
- Writing a good discharge summary, proper referral letter
- Examination of patient and arrival at a diagnosis
- Planning for investigation and treatment
- Community orientation, participation in community health promoting and preventing programmes
- Examine a pregnant woman, recognize high- risk pregnancies and make appropriate referrals.
- Conduct a normal delivery, plot and inter pretepartogram
- Recognize complications and decision of referral, provide postnatal care,
- Resuscitate the newborn and recognize the congenital anomalies.
- Advise a couple on the use of various available contraceptive devices (student should see at least 5 Cu-Tinsertions and 5 cases of female sterilization operations.)
- Perform pelvic examination, diagnose and manage common. gynecological problems including early detection of genital malignancies.
- Make a vaginal cytological smear, perform a post coital test and wet vaginal smear examination for Trichomonas vaginalis, Moniliasis and gram stain for gonorrhea, catheterization of urinary bladder
- Interpretation of data of investigations like biochemical, histopathological, radiological ultrasound etc.

d. Integration: The teaching should be aligned and integrated horizontally and vertically in order to provide comprehensive care for women in their reproductive years and beyond, based on a sound knowledge of structure, functions and disease and their clinical, social, emotional, psychological correlates in the context of national health priorities. The student shall be able to integrate clinical skills with other disciplines and bring about coordination of family welfare programme for the national goal of population control.

B. PHASE WISE TRAINING AND TIME DISTRIBUTION FOR PROFESSIONAL DEVELOPMENT

The Competency based Undergraduate Curriculum and Attitude, Ethics and Communication (AETCOM) course, as published by the Medical Council of India and also made available on the Council's website, shall be the curriculum for the batches admitted in MBBS from the academic year 2019-20 onwards.

In order to ensure that training is in alignment with the goals and competencies required for a medical graduate, there shall be a **Foundation Course** to orient medical learners to MBBS programme, and provide them with requisite knowledge, communication (including electronic), technical and language skills.

I. Training period and time distribution:

Universities shall organize admission timing and admission process in such a way that teaching in the first Professional year commences with induction through the Foundation Course by the 1st of August of each year. There shall be no admission of students in respect of any academic session beyond 30th August under any circumstance. The Universities shall not register any student admitted beyond the said date.

The National Medical Commission may direct, that any student identified as having Obtained admission after the last date for closure of admission be discharged from the Course of study, or any medical qualification granted to such a student shall not be a recognized qualification by National Medical Commission.

The institution which grants admission to any student after the last date specified from the same shall also be liable to face such action as may be prescribed by National Medical Commission.

Every learner shall undergo a period of certified study extending over 4 ½ academic years, divided into four professional years from the date of commencement of course to the date of completion of examination which shall be followed by one year of compulsory rotating internship.

Each academic year will have at least 39 teaching weeks with a minimum of eight hours of working on each day including one hour as lunch break.

Didactic lectures shall not exceed one third of the schedule; two third of the schedule shall include interactive sessions, practicals, clinical or/and group discussions. The learning process should include clinical experiences, problem- oriented approach, case studies and community health care activities.

Teaching and learning shall be aligned and integrated across specialties both vertically and horizontally for better learner comprehension. Learner centered learning methods should include Early Clinical Exposure, problem-oriented learning, case studies, community- oriented learning, self- directed, experiential learning& Electives.

At the end of each professional year University examination will be conducted. If any student fails to clear University examination, he will appear in supplementary examination.

Supplementary examinations and declaration of results shall be processed within 3-6 weeks from the date of declaration of the results of the main examination for every professional year, so that the candidates, who pass, can join the main batch for progression.

If the candidate fails in the supplementary examination of first MBBS, he shall join the batch of next academic /subsequent year. There shall be no supplementary batches. Partial attendance of examination in any subject shall be counted as an attempt.

- A candidate, who fails in the First Professional examination, shall not be allowed to join the Second Professional.
- A candidate, who fails in the second Professional examination, shall be allowed to join the third Professional Part I training, however he shall not be allowed to appear for the examination unless he has passed second professional examination.
- A candidate who fails in the third Professional (Part I) examination shall be allowed to join third Professional part II training, however he shall not be allowed to appear for the examination unless he has passed second professional examination.

II. The period of 4½ years is divided as follows:

Phase I –Total 12 months

i) First Professional phase of 12 months including Foundation Course of one week and University exams.

It shall consist of preclinical subjects – Anatomy, Physiology, Biochemistry, Introduction to Community Medicine, Humanities, Professional development including Attitude, Ethics & Communication (AETCOM) module, family adoption programme through village outreach, Pandemic module and early clinical exposure, ensuring alignment & all types of integration and simulation-based learning.



Phase II- Second Professional (12 months) including University exam.

It will consist of Pathology, Pharmacology, Microbiology, family visit under Community Medicine, General Surgery, General Medicine & Obstetrics & Gynecology Professional development including AETCOM module, simulation-based learning and introduction to clinical subjects ensuring both alignment & all types of integration.

The clinical exposure to learners will be in the form of learner-doctor method of clinical training in all phases. The emphasis will be on primary, preventive and comprehensive health care. A part of training during clinical postings should take place at the *primary level* of health care. It is desirable to provide learning experiences in secondary health care, wherever possible. This will involve:

- Experience in recognizing and managing common problems seen in outpatient, inpatient and emergency settings,
- Involvement in patient care as a team member,
- Involvement in patient management and performance of basic procedures.

iii) Phase III - 30 months

a. Third Professional Part I (12 months, including University exams)

Forensic Medicine and Toxicology, Community Medicine, Medicine & allied, Surgery & allied, Pediatrics and Obstetric & Gynecology including AETCOM, Pandemic module, Clinical teaching in General Medicine, General Surgery, Obstetrics & Gynecology, Pediatrics, Orthopedics, Dermatology, Community Medicine, Psychiatry, Respiratory Medicine, Radio-diagnosis (& Radiotherapy) and Anesthesiology & Professional development.

b. Electives (1 month) shall be included here. These will be in 2 blocks of 15 days each in Final first; 1st block after annual exam of III MBBS part 1 and 2nd block after the end of 1st elective.

c. Third Professional Part II (18 months, including University exam)

Subjects include:

- Medicine and allied specialties (General Medicine, Psychiatry, Dermatology (including Venereology and Leprosy, Respiratory Medicine (including Tuberculosis)
- Surgery and allied specialties (General Surgery, Otorhinolaryngology, Ophthalmology, Orthopedics, Dentistry, Physical Medicine and rehabilitation, Anesthesiology and Radiodiagnosis)
- Obstetrics and Gynecology (including Family Welfare)
- Pediatrics
- AETCOM module



III. Distribution of teaching hours phase wise

a. First, second and third Professional part-I, teaching hours:

Time allotted : 12 months (approx. 52weeks)
Time available : Approx. **39 weeks** (excluding 13 weeks) (39 hours/ week)

Prelim / University Exam & Results: 9 weeks

Vacation: 2 weeks

Public Holidays: 2 weeks

Time distribution in weeks: 39 weeks x 39 hours = 1521 available hours for Teaching- Learning

b. Final MBBS part-2, teaching hours:

Time allotted : 18 months (approx. 78 weeks)
Time available : Approx. **62 weeks** (excluding 16 weeks) (39 hours/ week)

Prelim / University Exam & Results: 10 weeks

Vacation: 3 weeks

Public Holidays: 3 weeks

Time distribution in weeks: 62 x 39 hrs = 2418 hrs available hours for Teaching- Learning

(Clinical Postings: 15 hours/ week II MBBS onwards included in academic schedule)

These are attached in sperate annexure with all relevant tables.

- ❖ Academic calendar shall be as per the Table 1.
- ❖ Distribution of subjects for Professional Phase – wise training is given in Table 2.
- ❖ Minimum teaching hours prescribed in various disciplines are given in Tables 3-7.
- ❖ Distribution and duration of clinical postings is given in Table 8.

Time allotted excludes time reserved for internal /University examinations, and vacation.

Second professional clinical postings shall commence before / after declaration of results of the first professional phase examinations, as decided by the institution/ University.

Third Professional parts I and part II clinical postings shall start no later than two weeks after the completion of the previous professional examination.



A total of 25% of allotted time of third Professional shall be utilized for integrated learning with phase I and II subjects. This will be included in the assessment of clinical subjects.

Note :

- The period of training is minimum suggested. Adjustments where required depending on availability of time may be made by the concerned college/ institution. This period of training does not include University examination period.
- An exposure to skills lab for at least two (02) weeks prior to clinical postings shall be made available to all student.

C) New teaching /learning elements

1) Foundation Course

Goal: The goal of the Foundation Course is to prepare a learner to study medicine effectively.

Objectives:

(a)

Orient the learner to:

- The medical profession and the Physician's role in society
- The MBBS programme
- Alternate health systems i.e. AYUSH in India and history of Medicine
- Medical ethics, attitudes and professionalism
- Health care system and its delivery
- National health programmes and policies
- Universal precautions and vaccinations
- Patient safety and biohazard safety
- Principles of primary care (general and community based care)
- The academic ambience

(b) Enable the learner to acquire enhanced skills in:

- Language
- Interpersonal relationships
- Communication
- Learning including self-directed learning
- Time management
- Stress management
- Use of information technology, and artificial intelligence

(c) Train the learner to provide:

- First-aid
- Basic life support



- In addition to the above, learners maybe enrolled in one of the following programmes which will be run concurrently:
- Local language programme
- English language programme
- Computer skills

These may be done in the last two hours of the day. These sessions must be as interactive as possible.

Sports (to be used through the Foundation Course as protected 04 hours /week).

Leisure and extracurricular activity (to be used through the Foundation Course as projected 02 hours per week).

Institutions shall develop learning modules and identify the appropriate resource persons for their delivery.

The time committed for the Foundation Course may not be used for any other curricular activity.

The Foundation Course shall have a minimum of 75% attendance of all students mandatorily. This will be certified by the Dean of the college.

The Foundation Course shall be organized by the Coordinator appointed by the Dean of the college and shall be under supervision of the Heads of MBBS phase 1 departments.

Every college shall arrange for a meeting with parents/ wards of all students and records of the same shall be made available to UGMEB of NMC.

2) Early Clinical Exposure

Objectives: The objectives of early clinical exposure of the first-year medical learners are to enable the learner to:

- Recognize the relevance of basic sciences in diagnosis, patient care and management,
- Provide a context that will enhance basic science learning,
- Relate to experience of patients as a motivation to learn,
- Recognize attitude, ethics and professionalism as integral to doctor-Patient relationship,
- Understand the socio-cultural context of disease through the study of humanities.

- Elements
- Basic science correlation: i.e. apply and correlate principles of basic sciences as they relate to patient care (this shall be part of integrated modules).
- Clinical skills: to include basic skills in interviewing patients, doctor-patient communication, ethics and professionalism, critical thinking and analysis and self-learning (this training shall be imparted in the time allotted for early clinical exposure).
- Humanities: To introduce learners to a broader understanding of the socio-economic framework and cultural context within which health is delivered through the study of humanities and social sciences.

3) Electives

Objectives: To provide the learner with opportunities:

- For diverse learning experiences,
- It is mandatory for learners to do an elective. The elective time shall not be used to make up for missed clinical postings, shortage of attendance or other purposes.
- Institutions will pre-determine the number and nature of electives, names of the supervisors, and the number of learners in each elective based on the local conditions, available resources and faculty.
-
- Electives on topics in areas such as Research methodology, Use of Artificial intelligence and computers in Health and Medical Education, Health Management, Health economics, Indian system of medicine, Medical photography /clinical photography, Global health, Evidence based medicine, Art and music in medicine, Literary activities, etc. may be provided by the college/ institution.
- It shall be preferable that elective choices are made available to the learners in the beginning of the academic year.
- The learner must submit a learning log book based on both blocks of the electives.
- 75% attendance in the electives and submission of log book maintained during electives is required for eligibility to appear in the final MBBS examination/ NEXT.
- Institutions may use part of this time for strengthening basic skill certification.



4) Professional Development including Attitude, Ethics and Communication Module (AETCOM)

Objectives of the programme : At the end of the programme, the learner must demonstrate ability to:

- Understand and apply principles of bioethics and law as they apply to medical practice and research, understand and apply the principles of clinical reasoning as they apply to the care of the patients,
- Understand and apply the principles of system-based care as they relate to the care of the patient,
- Understand and apply empathy and other human values to the care of the patient,
- Communicate effectively with patients, families, colleagues and other health care professionals,
- Understand the strengths and limitations of alternative systems of medicine,
- Respond to events and issues in a professional, considerate and humane fashion,
- Translate learning from the humanities in order to further his professional and personal growth.

Learning experiences:

- This will be a longitudinal programme spread across the continuum of the MBBS programme including internship,
- Learning experiences shall include small group discussions, patient care scenarios, workshops, seminars, role plays, lectures etc.
- Attitude, Ethics & Communication Module (AETCOM module) developed by the erstwhile Medical Council of India should be used longitudinally for purposes of instruction.
- 75% attendance in Professional Development Programme (AETCOM Module) shall be mandatory for eligibility to appear for final examination in each professional year.

Internal Assessment shall include:

- Written tests comprising of short notes and creative writing experiences,
- OSCE based clinical scenarios /viva voce.
- At least one question in each paper of each clinical specialty in the University examination shall test knowledge competencies acquired during the professional development programme.
- Skill competencies acquired during the Professional Development Programme must be tested during the clinical, practical and viva voce.



5) Learner-doctor method of clinical training (Clinical Clerkship)

a. Goal: To provide learners with experience in:

- Longitudinal patient care,
- Being part of the health care team,
- Hands-on care of patients in outpatient and in-patient setting.

b. Structure:

- The first clinical posting in second professional shall orient learners to the patient, their roles and the specialty.
- The learner-doctor programme shall progress as outlined in Table 9.
- The learner shall function as a part of the health care team with the following responsibilities:
 - Be a part of the units' out-patient services on admission days,
 - Remain with the admission unit until at least 6 PM except during designated class hours,
 - Be assigned patients admitted during each admission day for whom he will undertake responsibility, under the supervision of a senior resident or faculty member,
 - Participate in the unit rounds on its admission day and will present the assigned patients to the supervising Physician,
- Follow the patient's progress throughout the hospital stay until discharge,
- Participate, under supervision, in procedures, surgeries, deliveries etc. of assigned patients,
- Participate in unit rounds on at least one other day of the week excluding the admission day,
- Discuss ethical and other humanitarian issues during unit rounds,
- Attend all scheduled classes and educational activities,
- Document his observations in a prescribed log book /case record.

No learner will be given independent charge of the patient in the capacity of primary Physician of the concerned patient.

The supervising Physician shall be responsible for all patient care decisions and guide the learner from time to time as required.

6) Assessment:

- A designated faculty member in each unit will coordinate and facilitate the



activities of the learner, monitor progress, provide feedback and review the log book/ case record.

- The log book/ case record must include the written case record prepared by the learner including relevant investigations, treatment and its rationale, hospital course, family and patient discussions, discharge summary etc.
- The log book shall also include records of outpatients assigned. Submission of the log book/ case record to the department is required for eligibility to appear for the final examination of the subject.

I. Eligibility to appear for Professional examinations

The performance in essential components of training are to be assessed, based on:

(a) Attendance

- There shall be a minimum of 75% attendance in theory and 80% in practical /clinical for eligibility to appear for the examinations in that subject. In subjects that are taught in more than one phase – the learner must have 75% attendance in theory and 80% in practical in each phase of instruction in that subject. There shall be minimum of 80% attendance in family visits under Family adoption programme.
- If an examination comprises more than one subject (for e.g., General Surgery and allied branches), the candidate must have a minimum of 75% attendance in each subject including its allied branches, and 80% attendance in each clinical posting.
- Learners who do not have at least 75% attendance in the electives will not be eligible for the Third Professional - Part II examination/ NEXT.

(b) Internal Assessment: Internal assessment shall be based on day-to-day assessment. It shall relate to different ways in which learners participate in learning process including assignments, preparation for seminar, clinical case presentation, preparation of clinical case for discussion, clinical case study/ problem solving exercise, participation in project for health care in the community. Internal assessment shall not be added to summative assessment. However, internal assessment should be displayed under a separate column in detailed marks card.

(c) Learners must have completed the required certifiable competencies for that phase of training and completed the log book appropriate for that phase of training to be eligible for appearing at the final University examination of that subject.

(d) Regular periodic examinations shall be conducted throughout the course. There shall be no less than three internal assessment examinations in each subject of first and second professional year, and no less than two examinations in each subject of final professional



year. An end of posting clinical assessment shall be conducted for each clinical posting in each professional year.

- When subjects are taught in more than one phase, the internal assessment must be done in each phase and must contribute proportionately to final assessment. For example, General Medicine must be assessed in second Professional, third Professional Part I and third Professional Part II, independently.
- Day to day records and log book (including required skill certifications) should be given importance in internal assessment. Internal assessment should be based on competencies and skills.
- The final internal assessment in a broad clinical specialty (e.g., Surgery and allied specialties etc.) shall comprise of marks from all the constituent specialties. The proportion of the marks for each constituent specialty shall be determined by the time of instruction allotted to each.
- Learners must secure at least 50% marks of the total marks (combined in theory and practical / clinical; not less than 40% marks in theory and practical separately) for internal assessment in a particular subject in order to be eligible for appearing at the final University examination of that subject. Internal assessment marks will reflect as separate head of passing at the summative examination.
- The results of internal assessment should be displayed on the notice board within one week of the test.
- Universities shall guide the colleges regarding formulating policies for remedial measures for students who are either not able to score qualifying marks or have missed on some assessments due to any reason.

II. University Examinations:

University examinations are to be designed with a view to ascertain whether the candidate has acquired the necessary knowledge, minimal level of skills, ethical and professional values with clear concepts of the fundamentals which are necessary for him to function effectively and appropriately as a Physician of the first contact. Assessment shall be carried out on an objective basis to the extent possible.

- Nature of questions shall include different types such as structured assays (Long-Answer Questions -LAQ), Short-Answer Questions (SAQ) and objective type questions (e.g. Multiple Choice Questions - MCQ). Marks for each part shall be indicated separately. MCQs shall be accorded a weightage of not more than 20% of the total theory marks. In subjects that have two papers, the learner must secure minimum 50% of marks in aggregate (both papers together) to pass.
- Practical /clinical examinations shall be conducted in the laboratories and /or hospital wards. The objective will be to assess proficiency and skills to conduct experiments, interpret data and form logical conclusion. Clinical cases kept in the examination must be common conditions that the learner may encounter as a



Physician of first contact in the community. Selection of rare syndromes and disorders as examination cases is to be discouraged. Emphasis should be on candidate's capability to elicit history, demonstrate physical signs, write a case record, analyze the case and develop a management plan.

- Viva/oral examination should assess approach to patient management, emergencies, and attitudinal, ethical and professional values. Candidate's skill in interpretation of common investigative data, X-rays, identification of specimens, ECG, etc. is to be also assessed.

University Examinations shall be held as under:

(a) First Professional

The first Professional examination shall be held at the end of first Professional training (in the 12th month of that training), in the subjects of Anatomy, Physiology and Biochemistry.

(b) Second Professional

The second Professional examination shall be held at the end of second professional training (12th month of that training), in the subjects of Pathology, Microbiology, and Pharmacology.

(c) Third Professional

- Third Professional Part I examination shall be held at end of third Professional part I of training (12th month of that training) in the subjects of Community Medicine, and Forensic Medicine including Toxicology
- Third Professional Part II / National Exit Test (NExT) as per NExT regulations- (Final Professional) examination shall be at the end of 17th / 18th month of that training, in the subjects of General Medicine, General Surgery, Ophthalmology, Otorhinolaryngology, Obstetrics & Gynecology, and Pediatrics, and allied subjects as per NExT REGULATIONS.



Note:

- At least one question in each paper of each PHASE shall test the knowledge, and competencies acquired during the professional development programme (AETCOM module).
- Skills competencies acquired during the Professional Development Programme (AETCOM module) shall be tested during clinical, practical and viva.

In subjects that have two papers, the learner must secure minimum 50% of marks in aggregate (both papers together) to pass in the said subject

Criteria for passing in a subject: A candidate shall obtain 50% marks in University conducted examination separately in Theory and in Practical (practical includes: practical/ clinical and viva voce) in order to be declared as passed in that subject.

Appointment of Examiners

- Person appointed as an examiner in the particular subject must have at least four years of total teaching experience as Assistant Professor after obtaining postgraduate degree in the subject in a college affiliated to a recognized medical college (by UGMEB of NMC).
- For Practical /Clinical examinations, there shall be at least four examiners for every learner, out of whom not less than 50% must be external examiners. Of the four examiners, the senior-most internal examiner shall act as the Chairman and coordinator of the whole examination programme so that uniformity in the matter of assessment of candidates is maintained.
- A University having more than one college shall have separate sets of examiners for each college, with internal examiners from the concerned college. External examiner may be from outside the college/ University/ state/ union territory.
- There shall be a Chairman of the Board of paper-setters who shall be an internal examiner and shall moderate the questions.
- All eligible examiners with requisite qualifications and experience can be appointed internal examiners by rotation in their subjects.
- All theory paper assessment should be done as central assessment program (CAP) of the concerned University.
- Internal examiners shall be appointed from the same institution for unitary examination in the same institution. For pooled examinations at one centre, the approved internal examiners from same University may be appointed.
- There shall be no grace marks to be considered for passing in an examination.

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AETCOM Competencies for First MBBS

Subject	Competency Number	Competency
Anatomy	Module 1.5	The cadaver as our first teacher Demonstrate respect and follow the correct procedure when handling cadavers and other biologic tissue
	Module 1.1	Identify, discuss Physician's role and responsibility to society and the community that he serves
Physiology	Module 1.2, Module 1.3	Demonstrate empathy in patient encounters
	Module 1.4	Demonstrate ability to communicate to patients in a patient, respectful, non-threatening, non-judgmental and empathetic manner
Biochemistry	Module 1.1,	Enumerate and Describe the role of a Physician in health care system
	Module 1.1	Describe and discuss the commitment to lifelong learning as an important part of Physician growth



AETCOM Competencies for Second MBBS

Subject	Competency Number	Competency
Pathology	2.6	Identify, discuss and define medico-legal, socio-cultural and ethical issues as they pertain to refusal of care including do not resuscitate and withdrawal of life support.
	2.4 A	Demonstrate ability to work in a team of peers and superiors.
	2.4 B	Demonstrate respect in relationship with patients, fellow team members, superiors and other health care workers.
	2.7	Identify, discuss and defend, medico-legal, socio-cultural and ethical issues as they pertain to consent for surgical procedures.
Microbiology	Module 2.2 A	Describe and discuss the role of non-maleficence as a guiding principle in patient care
	Module 2.2 B	Describe and discuss the role of autonomy and shared responsibility as a guiding principle in patient care
	Module 2.2 C	Describe and discuss the role of beneficence of a guiding principle inpatient care
	Module 2.2 D	Describe and discuss the role of a Physician in health care system
	Module 2.2 E	Describe and discuss the role of justice as a guiding principle in patient Care
	Module 2.3	Describe and discuss the role of justice as a guiding principle in patient care
	Module 2.5	Identify, discuss and defend medico-legal, socio-cultural and ethical issues as it pertains to patient autonomy, patient rights and shared responsibility in health care
Pharmacology	Module 2.1	Demonstrate ability to communicate to patients in a patient, respectful, non-threatening, non-judgmental and empathetic manner.
	Module 2.8	Demonstrate empathy in patient encounters.



AETCOM Competencies for Third Year (Part I)

Subject	Competency Number	Competency
Ophthalmology	3.1	Demonstrate ability to communicate to patients in a patient, respectful, nonthreatening, non-judgmental and empathetic manner
	3.2	Demonstrate an understanding of the implications and the appropriate procedure and response to be followed in the event of medical error
(Oto-Rhino-Laryngology(ENT)	3.3 A	Demonstrate ability to communicate to patients in a patient, respectful, nonthreatening, non-judgmental and empathetic manner
	3.3 B	Identify, discuss and defend, medico-legal, socio-cultural and ethical issues as they pertain to consent for surgical procedures
Forensic Medicine & Toxicology	3.3 C	Administer informed consent and appropriately address patient queries to a patient undergoing a surgical procedure in a simulated environment
	3.4	Identify, discuss and defend medico-legal, socio-cultural and ethical issues as it pertains to confidentiality in patient care
Community Medicine	3.5 A	Identify, discuss and defend medico-legal, socio-cultural, professional and ethical issues as it pertains to the physician - patient relationship (including fiduciary duty)
	3.5 B	Identify and discuss physician's role and responsibility to society and the community that she/ he serves



AETCOM Competencies for Third Year (Part II)

Subject	Competency Number	Competency
Medicine and Allied Subjects	4.1 A	The student should be able to: Demonstrate ability to communicate to patients in a patient, respectful, nonthreatening, non-judgmental and empathetic manner
	4.1 B	The student should be able to: Communicate diagnostic and therapeutic options to patient and family in a simulated environment
	4.3	The student should be able to: Identify and discuss medico-legal, socio-economic and ethical issues as it pertains to organ donation
Surgery and Allied Subjects	4.4 A	The student should be able to: Demonstrate empathy in patient encounters
	4.4 B	The student should be able to: Communicate care options to patient and family with a terminal illness in a simulated environment
	4.5	The student should be able to: Identify and discuss and defend medico-legal, socio-cultural, professional and ethical issues in physician - industry relationships
	4.6	The student should be able to: Identify conflicts of interest in patient care and professional relationships and describe the correct response to these conflicts
Obstetrics and Gynecology	4.2	The student should be able to: Identify, discuss and defend medico-legal, socioeconomic and ethical issues as it pertains to abortion / Medical Termination of Pregnancy and reproductive rights
	4.7	The student should be able to: Identify conflicts of interest in patient care and professional relationships and describe the correct response to these conflicts
	4.8 A	The student should be able to: Identify conflicts of interest in patient care and professional relationships and describe the correct response to these conflicts.
	4.8 B	The student should be able to: Demonstrate empathy to patient and family with a terminal illness in a simulated environment.
Pediatrics	4.9 A	The student should be able to: Identify, discuss and defend medico-legal, socio-cultural, professional and ethical issues pertaining to medical negligence
	4.9 B	The student should be able to: Identify, discuss and defend medico-legal, socio-cultural, professional and ethical issues pertaining to malpractice



Table1: Time distribution of MBBS Programme & Examination Schedule

Academic Calendar for CBME 2023-24 Batch

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2023								1	2	3	4	5
2024	6	7	8	9	10	11	12-1 st Prof exam, result	13-2 nd MBBS	14	15	16	17
2025	18	19	20	21	22	23	24-2 nd Prof exam, result	25-Final 1 st	26	27	28	29
2026	30	31	32	33	34	35	36-Final 1 st exam, result	37-Final 2 nd	38	39	40	41
2027	42	43	44	45	46	47	48	49	50	51	52	53 Final Exam/NExT
2028	54 NExT	1-CRMI	2	3	4	5-2 nd NExT	6	7	8	9	10	11
2029	12 NExT											

Legends:

AETCOM: Attitude, Ethics and Communication skills

FAP: Family Adoption Programme (village outreach)

SDL: Self Directed Learning

SGL: Small Group Learning (tutorials/ Seminars/ Integrated Learning)

Note : NExT shall be as per NExT Regulations

Table2: Distribution of subjects in each Professional Phase

Phase & year of MBBS training	Subjects & Teaching Elements	Duration (months)	University Examination
First Professional MBBS	(i) Foundation course -1 week, remaining spread over 6 months at the discretion of college. (ii) Anatomy, Physiology & Biochemistry, Introduction to Community Medicine, Family adoption programme (FAP) through village outreach (iii) Medicine, Humanities. (iv) Early Clinical Exposure. (v) Attitude, Ethics, and communication Module (AETCOM)	12 months	1 st professional
Second Professional MBBS	(i) Pathology, Microbiology, Pharmacology (ii) Introduction to clinical subjects (iii) Clinical postings, Family visits for FAP (iv) AETCOM	12 months	2 nd professional
Third Professional part 1, MBBS, including Electives 1 month	(i) Community Medicine, Forensic Medicine and Toxicology, Medicine & allied, Surgery & allied, Pediatrics and Obstetrics & Gynecology. (ii) Family visits for FAP (iii) Clinical postings (iv) AETCOM (v) Electives- 1 month, 2 blocks, 15 days each	12 months	Final professional- Part 1
Third Professional part 2, MBBS	(i) General Medicine, Dermatology, Psychiatry, Respiratory medicine, Pediatrics, General Surgery, Orthopedics, Otorhinolaryngology, Ophthalmology, Radiodiagnosis, Anesthesiology, Obstetrics & Gynecology (ii) Clinical postings (iii) AETCOM	18 months	Final Professional- Part II



Table 3: Foundation Course

(one week + spread over 6 months at the discretion of college)

Subjects/Contents	Teaching hours
Orientation	30
Skills Module	34
Field visit to Community Health Center	08
Introduction to Professional Development & AETCOM module	40
Sports, Yoga and extra-curricular activities	16
Enhancement of language/computer skills	32
Total	160



Table No. 4 - Distribution of Subject Wise Teaching Hours for 1st MBBS

Subject	Lectures	SGL	SDL	Total
Foundation Course	-	-	-	39
Anatomy	210	400	10	620
Physiology*	130	300	10	440
Biochemistry	78	144	10	232
Early Clinical Exposure**	27	-	-	27
Community Medicine	20	20	-	40
FAP	-	-	27	27
(AETCOM)***	-	26	-	26
Sports and extra-curricular activities	-	-	-	10
Formative Assessment and Term examinations	-	-	-	60
Total	464	918	30	1521 #

- Including Molecular Biology

** Early Clinical exposure hours to be divided equally in all three subjects.

***AETCOM module shall be a longitudinal programme.

Includes hours for Foundation course also



Table No. 5 - Distribution of Subject Wise Teaching Hours for II MBBS

Subjects	Lectures	SGL	Clinical Postings*	SDL	Total
Pathology	80	165	-	10	255
Pharmacology	80	165	-	10	255
Microbiology	70	135	-	10	215
Community Medicine	15	0	0	10	25
FAP	0	0	30	-	30
Forensic Medicine and Toxicology	12	22	-	08	42
Clinical Subjects	59	-	540	-	599
AETCOM	-	29	-	8	37
Sports and extra-curricular activities	-	-	-	20	35
Pandemic module				28	28
Final total	316	516	585	104	1521

Note : Clinical postings shall be for 3 hours per day, Monday to Friday.

There will be 15 hours per week for all clinical postings.



Table No. 6 - Distribution of Subject Wise Teaching Hours for Final MBBS part 1

Subject	Lectures	SGL	SDL	Total
Electives	0	156	0	156
Gen. Med.	30	50	10	90
Gen Surgery	30	50	10	90
Obs. & Gyn	30	50	10	90
Pediatrics	25	30	10	65
Ortho+ PMR	15	20	10	45
For. Med.& Tox.	40	70	20	130
Community Med	55	70	20	145
FAP (Visits +log book submission)	-	21	10	31
Otorhinolaryngology (ENT)	15	20	10	45
Ophthalmology	15	20	10	45
Clinical posting	-	-	540	540
AETCOM	0	19	12	31
Pandemic module	18	0	0	18
Total	273	546	672	1521



Table 7: Distribution of Subject wise Teaching Hours for
Third professional part-2/ Final MBBS

Subjects	Lectures	SGL	SDL	Total
General Medicine	80	140	40	260
General Surgery	80	140	40	260
Obstetrics and Gynecology	80	140	40	260
Pediatrics	30	60	30	120
Orthopedics + Phys. Med. Rehab	25	35	25	85
AETCOM	30	0	22	52
Dermatology	15	10	15	40
Psychiatry	15	15	15	45
Respiratory Medicine	15	15	15	45
Otorhinolaryngology (ENT)	15	25	15	55
Ophthalmology	15	25	15	55
Radiodiagnosis +RT	8	15	15	38
Anesthesiology	8	15	15	38
Pandemic module	28	-	-	28
TOTAL	444	610	302	1356

Extra time for SDL/preparation for NExT

Table No. 8: Clinical Posting Schedules in weeks

Subjects	Period of training in weeks			Total Weeks
	II MBBS	III MBBS Part I	III MBBS Part II	
Electives	0	4	0	4
General Medicine	7	4	10	21
General Surgery	7	4	10	21
Obstetrics & Gynaecology	7	4	10	21
Pediatrics	4	4	5	13
Community Medicine	4	4	0	8
Orthopaedics, PMR, Trauma	2	2	4	8
Otorhinolaryngology	0	3	4	7
Ophthalmology	0	3	4	7
Respiratory Medicine	0	0	3	3
Psychiatry	0	2	4	6
Radio-diagnosis	0	0	2	2
Dermatology	2	2	2	6
Dentistry	1	0	0	1
Anaesthesiology	0	0	3	3
Emergency Medicine	2	0	1	3
Total	36	36	62	134



Table 9: Learner- Doctor programme (Clinical Clerkship)

Year of Curriculum	Focus of Learner-Doctor programme
Year 1	Introduction to hospital environment, early clinical exposure, understanding perspectives of illness, Family Adoption Program(FAP)
Year 2	History taking, physical examination, assessment of change in clinical status, communication and patient education, FAP
Year 3	All of the above and choice of investigations, basic procedures and continuity of care
Year 4	All of the above (except FAP) and decision making, management and outcomes



Table 10 : Marks distribution for various subjects for University Annual Examinations

Phase of Course	Theory	Practicals	Passing criteria
1st MBBS			
Anatomy- 2 papers	Paper 1- 100	100	Mandatory to get 50% marks separately in theory and in practicals.
	Paper 2 -100		
Physiology- 2 papers	Paper 1- 100	100	
	Paper 2 -100		
Biochemistry- 1 paper	Paper 1- 100	50	
2nd MBBS			For theory, papers 1 and 2 for the same subject, aggregate of 50% in both papers.
Pathology - 2 papers	Paper 1- 100	100	
	Paper 2 -100		
Microbiology- 1 paper	Paper 1- 100	50	
Pharmacology- 2 papers	Paper 1 -100	100	
	Paper 2- 100		
Final MBBS part 1			
Forensic Med. Tox.- 1 paper	Paper 1 - 100	50	
Community Med- 2 papers	Paper 1 -100	100	
	Paper 2- 100		

For NEXT, as per NEXT regulations.

**GUIDELINES FOR MANPOWER REQUIREMENT FOR RESEARCH FACILITIES
IN A MEDICAL COLLEGE**

Research labs can be under following categories:

1. Molecular lab
2. Stem cell research lab
3. Cytogenetics
4. HLA and tissue typing research lab

Applied Clinical research for organ perfusion, cancer research, in vitro fertilization, etc. can be under any of the above research facilities.

MAN POWER:

(1) Lab Director : **1(One) Post**

Minimum Qualifications required :

- (i) MD Path/MD Microbiology/MD Transfusion Medicine/MD Biochemistry.
- (ii) Faculty with PhD (Medical subject will be preferred)

Lab work : 10 years experience

Lab research related publications : Minimum 10 in last 10 years

(2) Lab Supervisor : **1(One) Post (per research facility)**

Minimum Qualifications required:

- (i) MD Path/ MD Microbiology/MD Transfusion Medicine/MD Biochemistry
- (ii) Faculty with Ph.D. (Medical subject) will be preferred, or M.Sc. in life sciences with PhD from Medical college.

Lab work : 7 years experience

Lab research related publications : Minimum 5 in last 5 years

(3) Senior Scientific Research Officer : **1(One) Post or more (per research facility)**



- Minimum Qualifications required :
- (i) PhD with MD Path/MD Microbiology/MD Transfusion Medicine/MD Biochemistry/PhD in medical college or MSc in life sciences with PhD from medical college
- Lab work : 4 years experience
- Lab research related publications : Minimum 3 in last 3 years
- (4) **Junior Research Officer** : 1(One) or more (per research facility)
- Minimum Qualifications required :
- (i) MD Path/ MD Microbiology/ MD Transfusion Medicine/MD Biochemistry or Diploma in Clinical Pathology/ M.Sc. in Life Sciences, Ph.D. scholar/ Postdoc fellow
- (ii) Diploma holder in any branch may pursue PhD if experience / research inclinations proved for minimum of 1 year. They can be enrolled for integrated Master's PhD course.
- Lab work : 1 year experience
- Lab research related publications : preferably 1 in last 2 years
- (5) **Laboratory Technicians** : **Minimum 2(two) Posts**
- Minimum Qualifications required :
- (i) B.Sc./M.Sc. in Life Sciences including Biotechnology,
- (ii) DMLT
- (6) **Data entry operator/ Clerk** : Minimum 1(One)

- Minimum Qualifications required :
Experience :
- (7) **Store keeper** : **Minimum 1(One)**
- Minimum Qualifications required :
Experience :
- (8) **Biostatistician** : **Minimum 1(One)**
- Minimum Qualifications required :
Experience :
- (9) **Lab attendant** :
- (10) **Peon/ Multi-task worker** :
- (11) **Clinical Monitors** :
- Any MBBS or above with research inclination
- (12) **Social worker/ MSW with applied research inclinations**



**NATIONAL MEDICAL COMMISSION (UNDERGRADUATE MEDICAL
EDUCATION) GUIDELINES, 2023**

CURRICULUM FOR FAMILY ADOPTION PROGRAMME

FAMILY ADOPTION PROGRAM:

This is being introduced with the aim of village outreach program for MBBS students. Every college may arrange one diagnostic medical camp in the village wherein identification of:

- a) anaemia, malnutrition in children, hypertension, diabetes mellitus, ischemic heart diseases, kidney diseases, any other local problems may be addressed.
- b) If required, patients shall be admitted in the hospital for acute illness under care of student, charges may be waived off or provide concession or govt. schemes.
- c) For chronic illness, students shall be involved.
- d) Subsidized treatment charges may be provided under govt. schemes or welfare schemes.
- e) Medical student may be allocated about 5 families and introduced in the first visit.
- f) Camps may be arranged by Dean and Community Medicine/ P.S.M. department with active involvement of Associate/ Asst. Professors, social worker and supporting staff. Local population may be involved with village leaders.
- g) Visit by students be made to the visit as mentioned in table below. Annual follow up diagnostic camp can be continued by the PSM department.

TARGETS TO BE ACHIEVED BY STUDENTS:

First Professional Year:

- a) Learning communication skills and inspire confidence amongst families
- b) Understand the dynamics of rural set-up of that region
- c) Screening programs and education about ongoing government sponsored health related programs
- d) Learn to analyse the data collected from their families
- e) Identify diseases/ ill-health/ malnutrition of allotted families and try to improve the standards

Second Professional Year

- a) Inspire active participation of community through families allotted
- b) Continue active involvement to become the first doctor /reference point of the family by continued active interaction
- c) Start compiling the outcome targets achieved

Third Professional Year

Analysis of their involvement and impact on existing socio-politico-economic dynamics in addition to improvement in health conditions



-Final visit to have last round of active interaction with families

-prepare a report to be submitted to department addressing:

- 1) Improvement in general health
- 2) Immunization
- 3) Sanitation,
- 4) De-addiction
- 5) Whether healthy lifestyles like reading good books, sports/ yoga activities have been inculcated in the house-holds.
- 6) Improvement in anaemia, tuberculosis control
- 7) Sanitation awareness
- 8) Any other issues
- 9) Role of the student in supporting family during illness/ medical emergency
- 10) Social responsibility in the form of environment protection programme in form of plantation drive (medicinal plants/trees), cleanliness and sanitation drives with the initiative of the medical student

Curriculum for Family Adoption Programme

Professional Year	Competency The student should be able to	Objectives	Suggested Teaching Learning methods	Suggested Assessment methods	Teaching Hours
1 st Professional	Collect demographic profile of allotted families, take history and conduct clinical examination of all family members	By the end of this visit, students should be able to compile the basic demographic profile of allocated family members	Family survey, Community clinics	Community case presentation, OSPE, logbook, journal of visit	6 hrs
	Organize health check-up and coordinate treatment of adopted family under overall guidance of mentor	By the end of this visit, students should be able to report the basic health profile and treatment history of allocated family members	Community clinics, Multispecialty camps	Community case presentation, OSPE, logbook, journal of visit	9 hrs
	Maintain communication & follow up of remedial measures	By the end of this visit, students should be able to provide details of communication maintained with family members for follow-up of treatment and	Reporting of follow up visits, PRA techniques (transact walk, group discussion) Community	Community case presentation, OSPE, logbook based of competency, journal of visit	6 hrs



	Take part in environment protection and sustenance activities.	suggested remedial measures By the end of this visit, students should be able to report the activities undertaken for environment protection and sustenance like study of environment of families, tree plantation/ herbal plantation activities conducted in the village	clinics, Participation in and Process documentation of activities (NSS activities) along with reporting of photographic evidences	logbook certification based of competency, journal of visit	6hrs (Total 27 hrs, 9 visits)
2 nd Professional	- Take history and conduct clinical examination of all family members - Organize health check-up and coordinate treatment of adopted family under overall guidance of mentor	By the end of this visit, students should be able to compile the updated medical history of family members and report their vitals and anthropometry By the end of this visit, students should be able to report the details of clinical examination like Hb %, blood group, urine routine and blood sugar along with treatment history of allocated family members	Family survey, Community clinics Community clinics, Multispecialty camps	Community case presentation, OSPE, logbook, journal of visit Community case presentation, OSPE, logbook, journal of visit	6 hrs 9 hrs

	Maintain communication & follow up of remedial measures	By the end of this visit, students should be able to provide details of communication maintained with family members for follow-up of treatment, and suggested remedial measures along with details of vaccination drive	Reporting of follow up visits, PRA techniques (transact walk, group discussion) Community clinics,	Community case presentation, OSPE, logbook based certification of competency, journal of visit	9 hrs
	Take part in environment protection and sustenance activities.	By the end of this visit, students should be able to report the activities undertaken for environment protection and sustenance like study of environment of families, tree plantation/ herbal plantation activities conducted in the village	Participation in and Process documentation of activities (NSS activities) along with reporting of photographic evidences	logbook based certification of competency, journal of visit	6 hrs
					(Total 30 hrs, 10 visits)
3 rd Professional	Take history and conduct clinical examination of all family members	By the end of this visit, students should be able to update the medical history of family members and their vitals and anthropometry	Family survey, Community clinics	Community case presentation, OSPE, logbook, journal of visit	3hrs
	Organize health check-up and coordinate treatment of adopted family under overall guidance of mentor	By the end of this visit, students should be able to report the details of clinical examination like Hb %, blood group, urine	Community clinics, Multispecialty camps	Community case presentation, OSPE, logbook, journal of visit	3hrs

		routine and blood sugar along with treatment history of allocated family members			
	Maintain communication & follow up of remedial measures	By the end of this visit, students should be able to provide details of communication maintained with family members for follow-up of treatment, and suggested remedial measures along with details of vaccination drive	Reporting of follow up visits, PRA techniques (transact walk, group discussion) Community clinics,	Community case presentation, OSPE, logbook based certification of competency, journal of visit	3hrs
	- Take part in environment protection and sustenance activities. - Council the family members of allotted families and analyze the health trajectory of adopted family under overall guidance of mentor	By the end of this visit, students should be able to report the activities undertaken for environment protection and sustenance like study of environment of families, tree plantation/ herbal plantation activities conducted in the village, By the end of this visit, students should be able to analyze and report the health trajectory of adopted family along with remedial measures adopted at individual, family and community level	Participation in and Process documentation of activities (NSS activities) along with reporting of photographic evidences, Small group discussion (report of the health trajectory of adopted family)	logbook based certification of competency, journal of visit	3hrs
					(total 21 hrs, 7 visits)

LOG BOOK FOR FAMILY ADOPTION

COLLEGE NAME :

UNIVERSITY :

ADDRESS DETAILS :

NAME OF THE STUDENT :

ROLL NO. :

VILLAGE NAME :

TEHSIL/ DISTRICT :

STATE/ UNION TERRITORY :

NAME OF THE MENTOR :

MENTOR STATUS :

Asst. Prof/ S.R. And Details
(If changed, details of subsequent
mentors)

NAME OF ASHA WORKER :

ADDRESS OF ASHA WORKER :

EXPERIENCE :

(SINCE HOW MANY YEARS IS HE/ SHE EMPLOYED)

(SEPARATE PAGE FOR EACH FAMILY BE MAINTAINED)

- Family name and address
- Approximate size of living space of house-hold
- Malaria/ flu/ etc pertinent to the region

- 1) If there is any illness or medical emergency required by the house-hold, the student should take initiative in being the primary contact for the family.
- 2) The student in turn should consult his/her mentor for further management of the patient.
- 3) The hospital to which the college is attached must provide treatment facilities to the patient.
- 4) Government schemes may be utilized for optimal management.
- 5) Follow-up records must be maintained by the student. These must be periodically evaluated by mentors with the help of senior residents.
- 6) The entire data sheet may be prepared by every student and submitted by the end of 6th semester for evaluation.
- 7) Progress notes must include every demographic point and history recorded.



Appendix "H - I"

Guidelines regarding admission of students with "Specified Disabilities" under the Rights of Persons with Disabilities Act, 2016 with respect to admission in MBBS Course.

- Note : 1. The "Certificate of Disability" shall be issued in accordance with the Rights of Persons with Disabilities Rules, 2017 notified in the Gazette of India by the Ministry of Social Justice and Empowerment [Department of Empowerment of Persons with Disabilities (*Divyangjan*)] on 15th June 2017.
2. The extent of "specified disability" in a person shall be assessed in accordance with the "Guidelines for the purpose of assessing the extent of specified disability in a person included under the Rights of Persons with Disabilities Act, 2016 (49 of 2016)" notified in the Gazette of India by the Ministry of Social Justice and Empowerment [Department of Empowerment of Persons with Disabilities (*Divyangjan*)] on 4th January 2018.
3. The minimum degree of disability should be 40% (Benchmark Disability) in order to be eligible for availing reservation for persons with specified disability.
4. The term 'Persons with Disabilities' (PwD) is to be used instead of the term 'Physically Handicapped' (PH).

S. No.	Disability Type	Type of Disabilities	Specified Disability	Disability Range		
				Eligible for Medical Course, Not Eligible for PwD Quota	Eligible for Medical Course, Eligible for PwD Quota	Not Eligible for Medical Course
1.	Physical Disability	A. Locomotor Disability, including Specified Disabilities(a to f).	a. Leprosy cured person*	Less than 40% disability	40-80% disability Persons with more than 80% disability may also be allowed on case to case basis and their functional competency will be determined with the aid of assistive devices, if it is being used, to see if it is brought below 80% and whether they possess sufficient motor ability as required to pursue and complete the course satisfactorily.	More than 80%
			b. Cerebral Palsy**			
			c. Dwarfism			
			d. Muscular Dystrophy			
			e. Acid attack victims			
			f. Others*** such as Amputation, Poliomyelitis, etc.			
		* Attention should be paid to loss of sensations in fingers and hands, amputation, as well as involvement of eyes and corresponding recommendations be looked at. ** Attention should be paid to impairment of vision, hearing, cognitive function etc. and corresponding recommendations be looked at. *** (i) Both hands intact, with intact sensations, sufficient strength and range of motion are essential to be considered eligible for medical course. (ii) Movement of the upper limb with respect to all the joints (shoulder, elbow, forearm, wrist and all fingers) to be considered – full power, intact, in the dominant upper limb is necessary. (iii) For non-dominant upper limb, power of 4/5 or above is recommended.				
		B. Visual Impairment (*)	a. Blindness	Less than 40% disability	-	Equal to or More than 40% Disability
			b. Low vision			
		C. Hearing impairment@	a. Deaf	Less than 40% Disability	-	Equal to or more than 40% Disability
			b. Hard of hearing			
		(*) Persons with Visual impairment / visual disability of equal to or more than 40% may be made eligible to pursue MBBS Course and may be given reservation, subject to the condition that the visual disability is brought to a level of less than the benchmark of 40% with advanced low vision aids such as telescopes / magnifier etc. @Person with hearing disability of more than 40% may be made eligible to pursue MBBS Course and may be given reservation subject to condition that the hearing disability is brought to a level of less than the bench mark of 40% with the aid of assistive devices/cochlear implants (CI). In addition to this, the individual should have speech discrimination score of more than 60%				

	Type of Disabilities	Disability Range				
		Specified Disability	Eligible for Medical Course, Not Eligible for PwD Quota	Eligible for Medical Course, Eligible for PwD Quota	Not Eligible for Medical Course	
	D. Speech & language disability\$	Organic/ neurological calcauses	Less than 40% Disability	-	Equal to or more than 40% Disability	
	\$ Persons with Speech Intelligibility Affected (SIA) shall be eligible to pursue MBBS Courses, provided Speech Intelligibility Affected (SIA) score shall not exceed 3 (three), which is 40% or below. Persons with Aphasia shall be eligible to pursue MBBS Courses, provided Aphasia Quotient (AQ) is 40% or below.					
2.	Intellectual disability	a. Specific learning disabilities (Perceptual disabilities, Dyslexia, Dyscalculia, Dyspraxia & Developmental aphasia)#	# currently there is no Quantification scale available to assess the severity of SpLD, therefore the cut-off of 40% is arbitrary and more evidence is needed.	Less than 40% Disability	Equal to or more than 40% disability and equal to or less than 80%. But selection will be based on the learning competency evaluated with the help of the remediation/assisted technology/aids/infrastructural changes by the Expert Panel.	More than 80% or severe nature or significant cognitive/intellectual disability.
		b. Autism spectrum disorders	Absence or Mild Disability, Asperger syndrome (disability of upto 60% as per ISAA) where the individual is fit for MBBS course by an expert panel.	Currently not recommended due to lack of objective method to establish presence and extent of mental illness. However, the benefit of reservation/quota may be considered in future after developing better methods of disability assessment.	More than 60% disability or presence of cognitive/intellectual disability and/or if the person is unfit for pursuing MBBS course by an expert panel.	
3.	Mental behavior	Mental illness	Absence or mild Disability: less than 40% (under IDEAS)	Currently not recommended due to lack of objective method to establish presence and extent of mental illness. However, the benefit of reservation/quota may be considered in future after developing better methods of disability assessment. According to the Notification dated 09.12.2020 by the Department of Empowerment of Persons with Disabilities (Divyangjan), Ministry of Social Justice, a diagnosis of SLD using NIMHANS SLD Battery should be equated to more than 40% disability. Any person with SLD and more than 40% disability should be allowed to complete on par with other PwDs under the reservation quota for PwDs.	Equal to or more than 40% disability or if the person is unfit to perform his/her duties. Standards may be drafted for the definition of "fitness to practice medicine" as are used by several institutions of countries other than India.	

4.	Disability Type	Type of Disabilities	Specified Disability	Disability Range		
				Eligible for Medical Course, Not Eligible for PwD Quota	Eligible for Medical Course, Eligible for PwD Quota	Not Eligible for Medical Course
	Disability caused due to	a. Chronic Neurological Conditions	i. Multiple Sclerosis	Less than 40% Disability	40-80% disability	More than 80%
			ii. Parkinsonism			
		b. Blood Disorders	i. Haemophilia	Less than 40% Disability	40-80% disability	More than 80%
			ii. Thalassemia			
	iii. Sickle cell disease					
5.	Multiple disabilities including deaf		More than one of the abovespecified disabilities	Must consider all above while deciding in individual cases recommendations with respect to presence any of the above, namely, Visual, Hearing, Speech & Language disability, Intellectual Disability, and Mental Illness as a component of Multiple Disability. Combining Formula as notified by the related Gazette Notification issued by the Govt. of India $a + \frac{b(90-a)}{90}$ (where a= higher value of disability % and b=lower value of disability % as calculated for different disabilities) is recommended for computing the disability arising when more than one disabling condition is present in a given individual. This formula may be used in cases with multiple disabilities, and recommendations regarding admission and/or reservation made as per the specific disabilities present in a given individual		

(NMC Format)

1st year MBBS Student admission in College for the Year...

Name of the Medical College:

1	S.NO.	2	State	3	College name	4	Merit no.	5	Name of Students	6	Gender	7	Physically Handicapped	8	Date of Birth	9	Category	10	Sub-category	11	Marks obtained/ maximum marks in 10+2 (PCB)	12	PCB percentage	13	Marks obtained /maximum marks in 10+2 (English)	14	English Percentage	15	Marks obtained/Maximu m marks in NEET Entrance Exam	16	NEET Entrance Exam Percentage	17	Date of Admission	18	NEET Roll No.	19	Fees Charged
---	-------	---	-------	---	--------------	---	-----------	---	------------------	---	--------	---	------------------------	---	---------------	---	----------	----	--------------	----	---	----	----------------	----	---	----	-----------------------	----	--	----	----------------------------------	----	-------------------	----	---------------	----	--------------



Faculty : MBBS Year/Phase-

DEPARTMENT OF Anatomy/Physiology/Biochemistry

		Formative Assessment_Theory			Continuous Internal assessment_Theory							Cumulative percent of Theory & Practical		
S.No.	Roll No.	1st PCT Theory	2nd PCT Theory	Prelims Theory (Paper I & II)	Home Assignment	Seminar	Continuous Class Test (LMS)	Museum study	Library assignments	Attendance Theory	Total	Percentage Theory (Minimum cut off 40%)	Theory+ Practical = 500+500= 1000 (Minimum cut off 50%)	
		100	100	200	15	15	30	15	15	10	500	%	Note: Minimum 40% separately for theory and practical and 50% cumulative in IA for eligibility in Summative examination	
1														
2														
3														

Note: Minimum 40% separately for theory and practical and 50% cumulative in IA for eligibility in Summative examination

S/d
Professor & Head
Department of _____
*Medical College,
Univ.
State/ U.T.

Faculty : MBBS Year/Phase-

Department of Anatomy/Physiology/Biochemistry

Date : dd/mm/yyyy

			Formative Assessment			Continuous Internal Assessment (Practical)								
S.No.	Roll No.	Name of Student	1st PCT Practical/First Ward Leaving Examination	2nd PCT Practical /Second Ward Leaving Examination	Prelims Practical	Log book (150)					Journal (Record book/Portf	Attendance (Practical)	Total	Percentage Practical (Minimum cut off 40%)
						Certifiable skill based competencies (Through OSPE/OSCE/Spots/Exercise/Other	FAP competencies	AETCOM competencies	SVL Lab activity					
			100	100	100	70	10	30	40	40	10	500	%	
1														
2														
3														

S/d
Professor & Head
Department of _____
**Medical College
University, State/ U.T.



Faculty : MBBS Year/Phase-

Department OF Patho/Pharmac/Microbiology

S.No.	Roll No.	Name of Student	Formative Assessment_Theory		Continuous Internal assessment_Theory							Cumulative percent of Theory & Practical			
			1st PCT Theory	2nd PCT Theory	Prelims Theory (Paper I & II)	Home Assignment	Seminar	Continuous Class Test (LMS)	Museum study		Library assignments	Attendance Theory	Total	Percentage Theory (Minimum cut off 40%)	Theory+ Practical = 500+500= 1000 (Minimum cut off 50%)
									Self Directed Learning						
			100	100	200	15	15	30	15	15	10	500	%		
1															
2															
3															

Note: Minimum 40% separately for theory and practical and 50% cumulative in IA for eligibility in Summative examination

S/d
Professor & Head
Department of _____
College,
Univ.,
State/U.T.

Faculty : MBBS

Year/Phase-

Department of Patho/Pharmac/Microbiology

Date : dd/mm/yyyy

S.No.	Roll No.	Name of Student	Formative Assessment			Continuous Internal Assessment (Practical)								
			1st PCT Practical/First Ward Leaving Examination	2nd PCT Practical /Second Ward Leaving Examination	Prelims Practical	Log book (150)				FAP	Journal (Record book)	Attendance (Practical)	Total	Percentage Practical (Minimum cut off 40%)
						Certifiable skill based competencies (Through OSPE/OSCE/Sports/Exercise/Other)	AETCOM competencies	SVL Lab activity						
			100	100	100	60	30	40	20	40	10	500	%	
1														
2														
3														

S/d
Prof. , HOD,
College,
Univ.,
State/ U.T.



DEPARTMENT OF FORENSIC MEDICINE AND TOXICOLOGY

S.No.	Roll No.	Name of Student	Formative Assessment_Theory				Continuous Internal assessment_Theory					Cumulative percent of Theory & Practical		
			1st PCT Theory	2nd PCT Theory	Prelims Theory (Paper I & II)	Home Assignment	Seminar	Continuous Class Test (LMS)	Museum study	Library assignments	Attendance Theory	Total	Percentage Theory (Minimum cut off 40%)	Theory+ Practical = 375+500= 875 (Minimum cut off 50%)
1			100	100	100	10	10	25	10	10	10	375	%	
2														
3														

S/d
Professor & Head
Department of _____
* Medical College
University
State/
U.T.



Faculty : MBBS Year/Phase-

DEPARTMENT OF FORENSIC MEDICINE AND TOXICOLOGY

Date : dd/mm/yyyy

S.No.	Roll No.	Name of Student	Formative Assessment			Continuous Internal Assessment (Practical)					
			1st PCT Practical/First Ward Leaving Examination	2nd PCT Practical /Second Ward Leaving Examination	Prelims Practical	Log book (150)		Journal (Record book/ Portfolio)	Attendance (Practical)	Total	Percentage Practical (Minimum cut off 40%)
			100	100	100	Certifiable skill based competencies (Through OSPE/OSCE/Spots/Exercise/Other)	AETCOM competencies	SVL Lab activity			
1						70	40	40	40	10	500
2											%
3											



S/d
Professor & Head
Department of _____
* Medical College
University
State/ U.T.

DEPARTMENT OF COMMUNITY MEDICINE

S.No.	Roll No.	Name of Student	Formative Assessment_Theory			Continuous Internal assessment_Theory						Total	Cumulative percent of Theory & Practical		
			1st PCT Theory	2nd PCT Theory	Prelims Theory (Paper I & II)	Home Assignment	Seminar	Continuous Class Test (LMS)	Museum study	Library assignments	Attendance Theory		Percentage Theory (Minimum cut off 40%)	Theory+ Practical = 500+500= 1000 (Minimum cut off 50%)	
															Note: Minimum 40% separately for theory and practical and 50% cumulative in 1A for eligibility in Summative examination
1			100	100	200	15	15	30	15	15	10	500	%		
2															
3															

S/d
Professor & Head
Department of _____
* Medical College
University
State/
U.T.

Faculty : MBBS Year/Phase-

Department of Community Medicine

Date : dd/mm/yyyy

S.No.	Roll No.	Name of Student	Formative Assessment			Continuous Internal Assessment (Practical)						
			1st PCT Practical/First Ward Leaving Examination	2nd PCT Practical /Second Ward Leaving Examination	Prelims Practical	Log book (150)			Journal (Record book/ Portfolio)	Attendance (Practical)	Total	Percentage Practical (Minimum cut off 40%)
						Certifiable skill based competencies (Through OSPE/OSCE/Spots/Exercise/Other)	Family Adoption Programme competencies in Comm. Med	AETCOM competencies				
1			100	100	100	60	30	30	40	10	500	%
2												
3												



S/d
Professor & Head
Department of _____
* Medical College
University
State/ U.T.

DEPARTMENT OF Medicine, Surgery, OBGY

S.No.	Roll No.	Name of Student	Formative Assessment Theory				Continuous Internal assessment Theory					Cumulative percent of Theory & Practical		
			1st PCT Theory	2nd PCT Theory	Prelims Theory (Paper I & II)	Home Assignment	Seminar	Continuous Class Test (LMS)	Museum study	Library assignments	Attendance Theory	Total	Percentage Theory (Minimum cut off 40%)	Theory+ Practical = 500+550= 1150 (Minimum cut off 50%)
1			100	100	200	15	15	30	15	15	10	500	%	
2														
3														

S/d
Professor & Head
Department of _____
* Medical College, University
State/ U.T.

DEPARTMENT OF Medicine, Surgery, OBGY

			Formative Assessment			Continuous Internal Assessment (Practical)						
			1st PCT Practical/First Ward Leaving Examination	2nd PCT Practical /Second Ward Leaving Examination	Prelims Practical	Log book (200)			Journal (Record book/Portf olio)	Attendance (Practical)	Total	Percentage Practical (Minimum cut off 40%)
S.No.	Roll No.	Name of Student				Certifiable skill based competencies (Through OSPE/OSCE/Spots/Exercise/Other)	AETCOM competencies	SVL Lab activity				
1			100	100	200	100	50	50	40	10	650	%
2												
3												

S/d
Professor & Head
Department of _____
*Medical College
University
State/ U.T.

DEPARTMENT OF PAEDIATRICS, OPHTHALMOLOGY, OTORHINOLARYNGOLOGY (ENT)

Faculty : MBBS Year/Phase-

DEPARTMENT OF Paediatrics/ Ophthalm/ ENT

S.No.	Roll No.	Name of Student	Formative Assessment_Theory			Continuous Internal assessment_Theory						Cumulative percent of Theory & Practical		
			1st PCT Theory	2nd PCT Theory	Prelims Theory (Paper I & II)	Home Assignment	Seminar	Continuous Class Test (LMS)	Museum study	Library assignments	Attendance Theory	Total	Percentage Theory (Minimum cut off %)	Theory+ Practical = 375+500= 875 (Minimum cut off 50%)
			100	100	100	10	10	25	10	10	10	375		
1														
2														
3														

Department of Paediatrics/ Ophthalm/ ENT

			Formative Assessment			Continuous Internal Assessment (Practical)						
			1st PCT Practical/First Ward Leaving Examination	2nd PCT Practical /Second Ward Leaving Examination	Prelims Practical	Log book (200)			Journal (Record book/Portfolio)	Attendance (Practical)	Total	Percentage Practical (Minimum cut off 40%)
S.No.	Roll No.	Name of Student				Certifiable skill based competencies (Through OSPE/OSCE/Spots/Exercise/Other)	AETCOM competencies	SVL Lab activity				
			100	100	200	100	50	50	40	10	650	%
1												
2												
3												



S/d
Professor & Head
 Department of _____
 *Medical College
 University
 State/ U.T.

दूरभाष/Phone : 25367033, 25367035, 25367036
फैक्स/Fax : 0091-11-25367024
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पॉकेट-14, सेक्टर-8, द्वारका, फेस-1, नई दिल्ली-77
Pocket- 14, Sector- 8, Dwarka,
Phase – 1, New Delhi-77

राष्ट्रीय आयुर्विज्ञान आयोग
National Medical Commission
(Undergraduate Medical Education Board)

No. U.14021/08/2023-UGMEB/

Dated the 13th June 2023

PUBLIC NOTICE

Consequent upon publication of “Graduate Medical Education Regulations 2023” in Gazette of India vide Notification dated 2nd June 2023 and subsequent guidelines issued by UGMEB on 12.06.2023 for admission in MBBS Course, following is informed that :

- (i) *Previous procedure / rules(as per Information Bulletin published by NTA) shall be followed for deciding “the inter-se-merit of candidates for tie-breaking” in NEET-UG 2023 result.*
- (ii) The word “January” in Clause 11(a) under the heading “**ADMISSION, COUNSELLING, MIGRATION ETC.**” in Chapter III of GMER 2023 may please be read as “December”. Necessary amendment is being issued separately.


(Dr. Aruna V. Vanikar)
President, UGMEB

दूरभाष/Phone : 25367033, 25367035, 25367036

फेक्स/Fax : 0091-11-25367024

ई-मेल/E-mail : ug@nmc.org.in

पॉकेट -14, सेक्टर-8, द्वारका, फेस-1,

नई दिल्ली-77

Pocket- 14, Sector- 8, Dwarka,
Phase - 1, New Delhi-77

राष्ट्रीय आयुर्विज्ञान आयोग
National Medical Commission
(Under Graduate Medical Education Board)

No. U.14021/8/2023-UGMEB

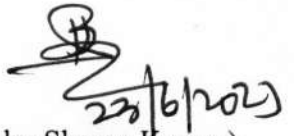
Date the 23rd June, 2023

PUBLIC NOTICE

Subject :- Seeking Comments of the stakeholders on National Medical Commission (Competency Based Medical Education Curriculum) Regulations, 2023 - Reg.

Undergraduate Medical Education Board proposes to make the above mentioned regulations in exercise of powers conferred by the National Medical Commission Act, 2019 and particularly by sections 10, 24, 25 and 57 of the said Act. A draft regulation in this regard is being shared for public comments.

2. It is requested to share comments on the draft regulations at the following email id comments.ugregulations@nmc.org.in in MS Word (.docx) format or machine readable PDF Format within 30 days of publication of this notice with a subject tagline "Comments on draft regulations regarding National Medical Commission (Competency Based Medical Education Curriculum) Regulations, 2023".


(Shambhu Sharan Kumar)
Director, UGMEB

CBME CURRICULUM

1. Preamble

The new Graduate Medical Education Regulations attempts to stand on the shoulder of the contributions and the efforts of resource persons, teachers and students (past and present). It intends to take the learner to provide health care to the evolving needs of the nation and the world.

About 25 years have passed since the existing Regulations on Graduate Medical Education, 1997 were notified, necessitating a relook at all aspects of the various components in the existing regulations and adapt them to the changing demography, socio-economic context, perceptions, values, advancements in medical education and expectations of stakeholders. Emerging health care issues particularly in the context of emerging diseases, impact of advances in science and technology and shorter distances on diseases and their management also need consideration. The strong and forward-looking fundamentals enshrined in the Regulations on Graduate Medical Education, 1997 has made this job easier. A comparison between the 1997 Regulations and proposed Graduate Medical Education Regulations, 2019 will reveal that the 2019 Regulations have evolved from several key principles enshrined in the 1997 Regulations.

The thrust in the new regulations is continuation and evolution of thought in medical education making it more learner-centric, patient-centric, gender- sensitive, outcome -oriented and environment appropriate. The result is an outcome driven curriculum which conforms to global trends. Emphasis is made on alignment and integration of subjects both horizontally and vertically while respecting the strengths and necessity of subject-based instruction and assessment. This has necessitated a deviation from using "broad competencies"; instead, the reports have written end of phase subject (sub) competencies. These "sub-competencies" can be mapped to the global competencies in the Graduate Medical Education Regulations.

The importance of ethical values, responsiveness to the needs of the patient and acquisition of communication skills is underscored by providing dedicated curriculum time in the form of a longitudinal program based on Attitude, Ethics and Communication (AETCOM) competencies. Great emphasis has been placed on collaborative and inter-disciplinary teamwork, professionalism, altruism and respect in professional relationships with due sensitivity to differences in thought, social and economic position and gender.

2. Objectives of the Indian Graduate Medical Training Programme

The undergraduate medical education program is designed with a goal to create an "Indian Medical Graduate" (IMG) possessing requisite knowledge, skills, attitudes, values and responsiveness, so that she or he may function appropriately and effectively as a Physician of first contact of the community while being globally relevant. To achieve this, the following national and institutional goals for the learner of the Indian Medical Graduate training program are hereby prescribed.



3. National Goals

At the end of undergraduate program, the Indian Medical Graduate should be able to:

- a. Recognize "health for all" as a national goal and health right of all citizens and by undergoing training for medical profession fulfill his social obligations towards realization of this goal.
- b. Learn key aspects of National policies on health and devote himself to its practical implementation.
- c. Achieve competence in practice of holistic medicine, encompassing promotive, preventive, curative and rehabilitative aspects of common diseases.
- d. Develop scientific temper, acquire educational experience for proficiency in profession and promote healthy living.
- e. Become exemplary citizen by observance of medical ethics and fulfilling social and professional obligations, so as to respond to national aspirations.

4. Institutional Goals

In consonance with the national goals, each medical institution should evolve institutional goals to define the kind of trained manpower (or professionals) they intend to produce. The Indian Medical Graduates coming out of a medical institute should:

- a. Be competent in diagnosis and management of common health problems of the individual and the community, commensurate with his/her position as a member of the health team at the primary, secondary or tertiary levels, using his/her clinical skills based on history, physical examination and relevant investigations.
- b. Be competent to practice preventive, promotive, curative, palliative and rehabilitative medicine in respect to the commonly encountered health problems.
- c. Appreciate rationale for different therapeutic modalities; be familiar with the administration of the "essential drugs" and their common side effects.
- d. Appreciate the socio-psychological, cultural, economic and environmental factors affecting health and develop humane attitude towards the patients in discharging one's professional responsibilities.
- e. Possess the attitude for continued self-learning and to seek further expertise or to pursue research in any chosen area of medicine, action research and documentation skills.



- f. Be familiar with the basic factors which are essential for the implementation of the National Health Programs including practical aspects of the following:
- i) Family Welfare and Maternal and Child Health (MCH);
 - ii) Sanitation and water supply;
 - iii) Prevention and control of communicable and non-communicable diseases;
 - iv) Immunization;
 - v) Health Education and advocacy;
 - vi) Indian Public Health Standards (IPHS) at various level of service delivery;
 - vii) Bio-medical waste disposal
 - viii) Organizational and or institutional arrangements.
- g. Acquire basic management skills in the area of human resources, materials and resource management related to health care delivery, general and hospital management, principal inventory skills and counseling.
- h. Be able to identify community health problems and learn to work to resolve these by designing, instituting corrective steps and evaluating outcome of such measures with maximum community participation.
- i. Be able to work as a leading partner in health care teams and acquire proficiency in communication skills.
- j. Be competent to work in a variety of health care settings.
- k. Have personal characteristics and attitudes required for professional life including personal integrity, sense of responsibility and dependability and ability to relate to or show concern for other individuals.

5. Goals for the Learner

In order to fulfill these goals, the Indian Medical Graduate must be able to function in the following roles appropriately and effectively:-

- a. Clinician who understands and provides preventive, promotive, curative, palliative and holistic care with compassion.
- b. Leader and member of the health care team and system with capabilities to collect, analyze, synthesize and communicate health data appropriately.
- c. Communicator with patients, families, colleagues and community.



- d. Lifelong learner committed to continuous improvement of skills and knowledge.
- e. Professional, who is committed to excellence, is ethical, responsive and accountable to patients, community and profession.
- f. Critical thinker who demonstrates problem solving skills in professional practice
- g. Researcher who generates and interprets evidence

6. Competency Based Training Programme of the Indian Medical Graduate

Competency based learning would include designing and implementing medical education curriculum that focuses on the desired and observable ability in real life situations. In order to effectively fulfill the roles, the Indian Medical Graduate would have obtained the following set of competencies at the time of graduation:

Clinician, who understands and provides preventive, promotive, curative, palliative and holistic care with compassion

- Demonstrate knowledge of normal human structure, function and development from a molecular, cellular, biologic, clinical, behavioral and social perspective.
- Demonstrate knowledge of abnormal human structure, function and development from a molecular, cellular, biological, clinical, behavioral and social perspective.
- Demonstrate knowledge of medico-legal, societal, ethical and humanitarian principles that influence healthcare.
- Demonstrate knowledge of national and regional health care policies including the National Health Mission that incorporates National Rural Health Mission (NRHM) and National Urban Health Mission (NUHM), frameworks, economics and systems that influence health promotion, health care delivery, disease prevention, effectiveness, responsiveness, quality and patient safety.
- Demonstrate ability to elicit and record from the patient, and other relevant sources including relatives and caregivers, a history that is complete and relevant to disease identification, disease prevention and health promotion.
- Demonstrate ability to elicit and record from the patient, and other relevant sources including relatives and caregivers, a history that is contextual to gender, age, vulnerability, social and economic status, patient preferences, beliefs and values.
- Demonstrate ability to perform a physical examination that is complete and relevant to disease identification, disease prevention and health promotion.
- Demonstrate ability to perform a physical examination that is contextual to gender, social and economic status, patient preferences and values.
- Demonstrate effective clinical problem solving, judgment and ability to interpret and integrate available data in order to address patient problems, generate differential diagnoses and develop individualized management plans that include preventive, promotive and therapeutic goals.
- Maintain accurate, clear and appropriate record of the patient in conformation with



legal and administrative frameworks.

- Demonstrate ability to choose the appropriate diagnostic tests and interpret these tests based on scientific validity, cost effectiveness and clinical context.
- Demonstrate ability to prescribe and safely administer appropriate therapies including nutritional interventions, pharmacotherapy and interventions based on the principles of rational drug therapy, scientific validity, evidence and cost that conform to established national and regional health programmers and policies for the following:
 - Disease prevention,
 - Health promotion and cure,
 - Pain and distress alleviation, and
 - Rehabilitation and palliation.
- Demonstrate ability to provide a continuum of care at the primary (including home care) and/or secondary level that addresses chronicity, mental and physical disability.
- Demonstrate ability to appropriately identify and refer patients who may require specialized or advanced tertiary care.
- Demonstrate familiarity with basic, clinical and translational research as it applies to the care of the patient.

Leader and member of the health care team and system

- Work effectively and appropriately with colleagues in an inter-professional health care team respecting diversity of roles, responsibilities and competencies of other professionals.
- Recognize and function effectively, responsibly and appropriately as a health care team leader in primary and secondary health care settings.
- Educate and motivate other members of the team and work in a collaborative and collegial fashion that will help maximize the health care delivery potential of the team.
- Access and utilize components of the health care system and health delivery in a manner that is appropriate, cost effective, fair and in compliance with the national health care priorities and policies, as well as be able to collect, analyze and utilize health data.
- Participate appropriately and effectively in measures that will advance quality of health care and patient safety within the health care system.
- Recognize and advocate health promotion, disease prevention and health care quality improvement through prevention and early recognition: in a) life style diseases and b) cancer, in collaboration with other members of the health care team.

Communicator with patients, families, colleagues and community

- Demonstrate ability to communicate adequately, sensitively, effectively and respectfully with patients in a language that the patient understands and in a manner that will improve patient satisfaction and health care outcomes.
- Demonstrate ability to establish professional relationships with patients and families that are positive, understanding, humane, ethical, empathetic, and trustworthy.



- Demonstrate ability to communicate with patients in a manner respectful of patient's preferences, values, prior experience, beliefs, confidentiality and privacy.
- Demonstrate ability to communicate with patients, colleagues and families in a manner that encourages participation and shared decision- making.

7. Lifelong learner committed to continuous improvement of skills and knowledge

- Demonstrate ability to perform an objective self-assessment of knowledge and skills, continue learning, refine existing skills and acquire new skills.
- Demonstrate ability to apply newly gained knowledge or skills to the care of the patient.
- Demonstrate ability to introspect and utilize experiences, to enhance personal and professional growth and learning.
- Demonstrate ability to search (including through electronic means), and critically re-evaluate the medical literature and apply the information in the care of the patient.
- Be able to identify and select an appropriate career pathway that is professionally rewarding and personally fulfilling.

Professional who is committed to excellence, is ethical, responsive and accountable to patients, community and the profession

- Practice selflessness, integrity, responsibility, accountability and respect.
- Respect and maintain professional boundaries between patients, colleagues and society.
- Demonstrate ability to recognize and manage ethical and professional conflicts.
- Abide by prescribed ethical and legal codes of conduct and practice.
- Demonstrate a commitment to the growth of the medical profession as a whole.

A. CURRICULUM

➤ **1st Professional Year:**

1. ANATOMY

a. Competencies:

The undergraduate must demonstrate:

- Understanding of the gross and microscopic structure and development of human body,
- Comprehension of the normal regulation and integration of the functions of the organs and systems on basis of the structure and genetic pattern,
- Understanding of the clinical correlation of the organs and structures involved and interpret the anatomical basis of the disease presentations.



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b. Broad subject specific objectives

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

- Comprehend the normal disposition, clinically relevant interrelationships, functional and cross -sectional Anatomy of the various organs and structures of the body.
- Identify the microscopic structure and correlate elementary ultra structure of various organs and tissues 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 analyze the integrative and regulative functions of the organs and systems. He should be able to locate the site of gross lesions according to the deficits encountered
- Demonstrate knowledge of the basic principles and sequential development of the organs and systems; recognize the critical stages of development and the effects of common teratogens, genetic mutations and environmental hazards. He should be able to explain the developmental basis of the major variations and abnormalities.

c. Skills:

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

- Identify and locate all the structures of the body and mark the topography of the Living Anatomy.
- Understand clinical basis of some common clinical procedures i.e. intramuscular and intravenous injection, lumbar puncture and kidney biopsy etc.
- Identify the organs and tissues under the microscope.
- Understand the principles of karyotyping and identify the gross congenital anomalies.
- Understand principles of newer imaging techniques and interpretation of CT scan, sonogram, MRI & Angiography.

- d. Integration:** The teaching should be aligned and integrated horizontally and vertically in organ systems with clinical correlation that will provide a context for the learner to understand the relationship between structure and function and interpret the anatomical basis of various clinical conditions and procedures.

2. PHYSIOLOGY

a. Competencies: The undergraduates must demonstrate:

- Understanding of the normal functioning of the organs and organ systems of the body,
- Comprehension of the normal structure and organization of the organs and systems on basis of the functions,
- Understanding of age-related physiological changes in the organ functions that reflect normal growth and development,



- Understand the physiological basis of diseases.

b. Broad subject specific objectives

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

- Describe the normal functions of all the systems, the regulatory mechanisms and interactions of the various systems for well coordinated total body functions.
- Understanding the relative contribution of each organ system in the maintenance of the milieu interior (homeostasis)
- Explain the physiological aspects of the normal growth and development.
- Analyze the physiological responses and adaptation to environmental stress. Comprehend the physiological principles underlying pathogenesis and treatment of disease.
- Correlate knowledge of physiology of human reproductive system in relation to National Family welfare program.

c. Skills : At the end of the course the student shall be able to:

- Conduct experiments designed for study of physiological phenomenon.
- Interpret experimental /investigative data.
- Distinguish between normal and abnormal data derived as a result of clinical examination and tests, which he has performed and observed in the laboratory.
- Recognize and get familiar with newer computerized and advanced instruments like medspiror, semen quality analyzer, EMG and TMT

d. Integration: The teaching should be aligned and integrated horizontally and vertically in organ systems in order to provide a context in which normal function can be correlated both with structure and with the biological basis, its clinical features, diagnosis and therapy.

3. BIOCHEMISTRY

a. Competencies: The learner must demonstrate an understanding of:

- Biochemical and molecular processes involved in health and disease,
- Importance of nutrition in health and disease,
- Biochemical basis and rationale of clinical laboratory tests, and demonstrate ability to interpret these in the clinical context.

b. Broad subject specific objectives:

Knowledge: At the end of the course, the student shall be able to



- Enlist and describe the cell organelles with their molecular and functional organization.
- Delineate structure, function and interrelationships of various biomolecules and consequences of deviation from the normal.
- Understand basic enzymology and emphasize on its clinical applications wherein regulation of enzymatic activity is disturbed.
- Describe digestion and assimilation of nutrients and consequences of malnutrition.
- Describe and integrate metabolic pathways of various biomolecules with their regulatory mechanisms.
- Explain the biochemical basis of inherited disorders with their associated sequel.
- Describe mechanisms involved in maintenance in water, electrolyte and acid base balance and consequences of their imbalances.
- Outline the molecular mechanisms of gene expression and regulation, basic principles of biotechnology and their applications in medicine.

c. Skills : At the end of the course, the student shall be able to:

- Make use of conventional techniques / instruments to perform biochemical analysis relevant to clinical screening and diagnosis;
- Analysis and interpret investigative data;
- Demonstrate the skills of solving scientific and clinical problems and decision making.

d. Integration: The teaching/learning programme should be integrated horizontally and vertically, as much as possible, to enable learners to make clinical correlations and to acquire an understanding of the cellular and molecular basis of health and disease.

2nd Professional Year:

4. PATHOLOGY

a. Competencies: The undergraduate must demonstrate:

- Comprehension of the causes, evolution and mechanisms of diseases,
- Knowledge of alterations in gross and cellular morphology of organs in disease states,
- Ability to correlate the natural history, structural and functional changes with the clinical manifestations of diseases, their diagnosis and therapy.

b. Broad subject specific objectives

Knowledge: At the end of one and half years, the student shall be able to:

- Describe the structure and ultra structure of a sick cell, causes and mechanisms of cell Injury, cell death and repair.
- Correlate structural and functional alterations in the sick cell.
- Explain the path physiological processes, which govern the maintenance of



homeostasis, mechanisms of their disturbance and the morphological and clinical manifestation associated with it.

- Describe the mechanisms and patterns of tissue response to injury so as to appreciate the path physiology of disease processes and their application to clinical science.
- Correlate the gross and microscopic alterations of different organ systems in common disease to the extent needed for understanding disease processes and their clinical significance.
- Develop an understanding of steps in neoplastic changes in the body and their effects in order to appreciate need for early diagnosis and further management of neoplasia.
- Understand mechanisms of common hematological disorders and develop a logical approach in their diagnosis and management.
- Develop understanding of the blood banking, blood donors & transfusion of blood & blood products, (components).
- Understand pathophysiology of infectious diseases in relation with tissue changes.
- Describe the various immunological reactions in understanding the disease process & tissue transplant.
- Develop an understanding for genetic disorders.
- Understand the vital organ function test of Kidney, liver & thyroid.

c. Skills : At the end of one and half years, the student shall be able to:

- Describe the rationale and principles of routine technical procedures of the diagnostic laboratory tests & perform it.
- Interpret routine diagnostic laboratory tests and correlate with clinical, hematological and morphological changes.
- Perform the simple bed-side tests on blood, urine and other biological fluid samples:
- Draw a rational scheme of investigations aimed at diagnosing and managing the cases of common disorders.
- Able to understand the microscopic and macroscopic features of common diseases.
- Develop different type of skills such as observation skills, communication skill and presentation skill.
- Understand biochemical/physiological disturbances that occur as a result of disease in collaboration with preclinical department.

d. Integration: The teaching should be aligned and integrated horizontally and vertically in organ systems recognizing deviations from normal structure and function and clinically correlated so as to provide an overall understanding of the etiology, mechanisms, laboratory diagnosis, and management of diseases.



5. MICROBIOLOGY

a. Competencies: The undergraduate learner demonstrates:

- Understanding of role of microbial agents in health and disease,
- Understanding of the immunological mechanisms in health and disease,
- Ability to correlate the natural history, mechanisms and clinical manifestations of infectious diseases as they relate to the properties of microbial agents,
- Knowledge of the principles and application of infection control measures,
- An understanding of the basis of choice of laboratory diagnostic tests and their interpretation, antimicrobial therapy, control and prevention of infectious diseases.
- Knowledge of outbreak investigation and its control.

b. Broad subject specific objectives : At the end of the course the student will be able to :

- Explain how the different microorganisms can cause human infection.
- Understand commercial, opportunistic and pathogenic organisms and describe host parasite relationship.
- Describe the characteristics (morphology, cultural characteristics, resistance, virulence factors, incubation period, mode of transmission etc.) of different microorganisms.
- Explain the various defense mechanisms of the host against the microorganisms which can cause human infection.
- Describe the laboratory diagnosis of microorganisms causing human infections and disease.
- Describe the prophylaxis for the particular infecting microorganisms

c. Skills : At the end of the course the student shall be able to

- Plan the laboratory investigations for the diagnosis of infectious diseases.
- Perform laboratory procedures to arrive at the etiological diagnosis of infectious diseases caused by bacteria, fungi, viruses and parasites including the drug sensitivity profile.
- Perform and interpret immunological and serological tests.
- Operate routine and sophisticated instruments in the laboratory.
- Develop microteaching skills and Pedagogy
- Successfully implement the chosen research methodology

d. Integration: The teaching should be aligned and integrated horizontally and vertically in organ systems with emphasis on host-microbe-environment interactions and their alterations in disease and clinical correlations so as to provide an overall understanding of the etiological agents, their laboratory diagnosis and prevention.



6. PHARMACOLOGY

a. Competencies: The undergraduate must demonstrate:

- Knowledge about essential and commonly used drugs and an understanding of the pharmacologic basis of therapeutics,
- Ability to select and prescribe medicines based on clinical condition and the pharmacologic properties, efficacy, safety, suitability and cost of medicines for common clinical conditions of national importance,
- Knowledge of pharmacovigilance, essential medicine concept and sources of drug information and industry-doctor relationship,
- Ability to counsel patients regarding appropriate use of prescribed drug and drug delivery systems.

b. Broad subject specific objectives :

Knowledge: At the end of the course, the student shall be able to

- Describe the Pharmacokinetics and Pharmacodynamics of essential and commonly used drugs.
- Enlist the indications, contraindications, interactions and adverse reactions of commonly used drugs.
- Tailor the use of appropriate drugs in disease with consideration of its cost, efficacy and safety for individual needs and Mass therapy, under National Health Programs.
- Integrate the list of drugs of addiction and recommend the management of drug addiction.
- Explain pharmacological basis of prescribing drugs in special medical situations such as pregnancy, lactation, infancy, old age, renal damage, hepatic damage and immuno-compromised patients.
- Explain the concept of rational drug therapy in clinical pharmacology.
- State the principles underlying the concept of 'Essential Drugs'.
- Evaluate the ethics and modalities involved in the development and introduction of new drugs.

c. Skills : At the end of the course, the student shall be able to

- Prescribe drugs for common ailments.
- Identify adverse reactions and drug interactions of commonly used drugs.
- Interpret the data obtained from the experiments designed for the study of effect of drugs in various experimental and clinical studies.
- Analyze the information regarding common pharmaceutical preparations and critically evaluate drug formulations.
- Appraise the Principles of Clinical Pharmacy and Dispense the Medications giving



proper instructions.

- d. **Integration:** Practical knowledge of use of drugs in Clinical Practice will be acquired through Integrated Teaching vertically with Preclinical and Clinical subjects and horizontally with other Para clinical subjects.

3rd PROFESSIONAL YEAR

7. FORENSIC MEDICINE AND TOXICOLOGY

a. **Competencies :** The learner must demonstrate:

- Understanding of medico-legal responsibilities of Physicians in primary and secondary care settings,
- Understanding of the rational approach to the investigation of crime, based on scientific and legal principles,
- Ability to manage medical and legal issues in cases of poisoning /overdose,
- Understanding the medico-legal framework of medical practice and medical negligence,
- Understanding of codes of conduct and medical ethics.

b. **Broad subject specific objectives:**

Knowledge: At the end of the course, the student shall be able to:

- Identify the basic Medico-legal aspects of hospital and general practice.
- Define the Medico-legal responsibilities of a general Physician while rendering community service either in a rural primary health centre or an urban health centre.
- Appreciate the Physician's responsibilities in criminal matters and respect for the codes of Medical ethics.
- Diagnose, manage and identify legal aspect of common acute and chronic poisonings.
- Describe the Medico-legal aspects and findings of post-mortem examination in cases of death due to common unnatural conditions and poisonings.
- Detect occupational and environmental poisoning, prevention and epidemiology of common poisoning and their legal aspects particularly pertaining to Workmen's Compensation Act.
- Describe the general principles of analytical toxicology.

c. **Skills :** At the end of the course, the student shall be able to :

- As recommended by Medical Council of India Regulation, 1997 desirable for Bachelor of Medicine and Bachelor of Surgery (MBBS) Graduate for Forensic Medicine and Toxicology.
- Make observations and draw logical inferences in order to initiate enquiries in criminal



matters and Medico-legal problems and be able to -

- Carry on proper Medico-legal examination and documentation/Reporting of Injury and Age.
- Conduct examination for sexual offences and intoxication.
- Preserve relevant ancillary materials for medico-legal examination.
- Identify important post-mortem findings in common unnatural deaths.
- Diagnose and treat common emergencies in poisoning and chronic toxicity.
- Make observations and interpret findings at post-mortem examination.
- Observe the principles of medical ethics in the practice of his profession.

- d. **Integration:** The teaching should be aligned and integrated horizontally and vertically recognizing the importance of medico-legal, ethical and toxicological issues as they relate to the practice of medicine.

8. COMMUNITY MEDICINE

a. **Competencies:** The undergraduate must demonstrate :

- Understanding of the concept of health and disease,
- Understanding of demography, population dynamics and disease burden in National and global context,
- Comprehension of principles of health economics and hospital management,
- Understanding of interventions to promote health and prevent diseases as envisioned in National and State Health Programmes.
- Understanding of physical, social, psychological, economic and environmental determinants of health and disease,
- Ability to recognize and manage common health problems including physical, emotional and social aspects at individual family and community level in the context of National Health Programmes,
- Ability to Implement and monitor National Health Programmes in the primary care setting,
- Knowledge of maternal and child wellness as they apply to national health care priorities and programmes,
- Ability to recognize, investigate, report, plan and manage community health problems including malnutrition and emergencies.

b. **Broad subject specific objectives:**

Knowledge: At the end of the course the student shall be able

- Explain the principles of sociology including demographic population dynamics.
- Identify social factors related to health, disease and disability in the context of urban and rural societies.



- Appreciate the impact of urbanization on health and disease.
- Observe and interpret the dynamic of community behaviors.
- Describe the elements of normal psychology and social psychology.
- Observe the principles of practice of medicine in hospital and community settings.
- Describe the health care delivery systems including rehabilitation of the disabled in the country.
- Describe the National Health Programmes with particular emphasis on maternal and child health programmes, family welfare planning and population control.
- Describe the epidemiological methods and techniques.
- Outline the demographic pattern of the country and appreciate the roles of the individuals, family, community and socio-cultural milieu in health and disease.
- Describe the health information systems.
- Acquire, understand, integrate, apply and manage information in context to health care problems and health care delivery system in various communities, health care settings and hospitals.
- Describe the principles and components of primary health care, National Rural Health Mission and the national health policies to achieve the goal of "Health for all" with regards to identify the environmental, bio-waste and occupational hazards and their control.
- Describe the importance of water and sanitation in human health.
- Describe the principles of health economics, health administration, health education in relation to community.
- Critically analyze the problem (s) and apply his/her knowledge to solve the problem in holistic manner.
- Describe and apply principles of prevention, promotion and maintenance of health.

c. Skills : At the end of the course, the student shall be able to :

- Use the principles and practice of medicine in hospital and community settings and familiarization with elementary practices.
- Use the Art of communication with patients including history taking and medico social work.
- Use epidemiology as a scientific tool to make rational decisions relevant to community and individual patient intervention.
- Organize health care services for vulnerable and disadvantages groups.
- Organize health care services in case of calamities.
- Collect, analyze, interpret and present simple community and hospital base data.
- Diagnose and manage common health problems (including communicable and non-communicable diseases) and emergencies at the individual, family and community levels keeping in mind the existing health care resources and in the context of the prevailing socio-culture beliefs.
- Diagnose and manage common nutritional problems at the individual and community



level.

- Plan, implement and evaluate a health education Programme with skill to use simple audio-visual aids.
 - Interact with other members of the health care team and participate in the organization of health care services, health advocacy and implementation of national health programmes.
 - Perform Administrative functions at health centers
 - Observe the principles of medical ethics in the practice of his profession.
- d. **Integration:** Department shall adopt an integrated approach towards other clinical disciplines, public health services, NGOs, environmental sciences, social sciences, management, hospital administration, research, etc. to impart training to enable the graduate to work at all levels of health care. The teaching should be aligned and integrated horizontally and vertically in order to allow the learner to understand the impact of environment, society and national health priorities as they relate to the promotion of health and prevention and cure of disease.

9. GENERAL MEDICINE

a. **Competencies:** The student must demonstrate ability to do the following in relation to common medical problems of the adult in the community:

- Demonstrate understanding of the pathophysiologic basis, epidemiological profile, signs and symptoms of disease and their investigation and management,
- Competently interview and examine an adult patient and make a clinical diagnosis.
- Appropriately order and interpret laboratory tests,
- Initiate appropriate cost-effective treatment based on an understanding of the rational drug prescriptions, medical interventions required and preventive measures,
- Follow up of patients with medical problems and refer whenever required,
- Communicate effectively, educate and counsel the patient and family,
- Manage common medical emergencies and refer when required,
- Independently perform common medical procedures safely and understand patient safety issues.

b. Broad subject specific objectives:

Knowledge: At the end of the course, the student shall be able to:

- Diagnose common clinical disorders with special reference to infectious diseases, nutritional disorders, tropical and environmental diseases;



- Outline various modes of management including drug therapeutics especially dosage, side effects, toxicity, interactions, indications and contra-indications;
- Propose diagnostic and investigative procedures and ability to interpret them;
- Provide first level management of acute emergencies promptly and efficiently and decide the timing and level of referral, if required;
- Recognize geriatric disorders and their management.

c. Skills : At the end of the course, the student shall be able to :

- Develop clinical skills (history taking, clinical examination and other instruments of examination) to diagnose various common medical disorders and emergencies;
- Refer a patient to secondary and/or tertiary level of health care after having instituted primary care;
- Perform simple routine investigations like hemogram, stool, urine, sputum and biological fluid examinations;
- Assist the common bedside investigative procedure like pleural tap, Lumbar puncture, bone marrow aspiration/biopsy and liver biopsy.

d. Integration: The teaching should be aligned and integrated horizontally and vertically in order to provide sound biologic basis and incorporating the principles of general medicine into a holistic and comprehensive approach to the care of the patient. With other relevant academic inputs which provide scientific basis of clinical medicine e.g. anatomy, physiology, biochemistry, microbiology, pathology and pharmacology.

10. DERMATOLOGY

a. Competencies: The undergraduate student must demonstrate:

- Understanding of the principles of diagnosis of diseases of the skin, hair, nail and mucosa,
- Ability to recognize, diagnose, order appropriate investigations and treat common diseases of the skin including leprosy in the primary care setting and refer as appropriate,
- A syndromic approach to the recognition, diagnosis, prevention, counseling, testing and management of common sexually transmitted diseases including HIV based on national health priorities,
- Ability to recognize and treat emergencies including drug reactions and refer as appropriate.

b. Broad subject specific objectives:

Knowledge: At the end of the course of Dermatology the student shall be able to :

- Demonstrate sound knowledge of common diseases, their clinical manifestations,

including emergent situations and of investigative procedures to confirm their diagnosis

- Demonstrate comprehensive knowledge of various modes of therapy used in treatment of cutaneous, sexually transmitted diseases and leprosy
- Describe the mode of action of commonly used drugs, their doses, side effects/toxicity, indications and contra-indications and interactions
- Describe commonly used modes of management including the medical and surgical procedures available for the treatment of various diseases and to offer a comprehensive plan of management for a given disorder

c. Skills: The student shall be able to :

- Interview the patient, elicit relevant and correct information and describe the history in a chronological order:
- Conduct clinical examination, elicit and interpret physical findings and diagnose common disorders and emergencies.
- Demonstrate simple, routine investigative and laboratory procedures required for making the bed-side diagnosis, especially the examination of scrapings for fungus, preparation of slit smears and staining for AFB for leprosy patients and for STD cases and take a skin biopsy for diagnostic purposes.
- Manage common diseases and recognizing the need for referral for specialized care, in case of inappropriateness of therapeutic response.

d. Integration: The teaching should be aligned and integrated horizontally and vertically in order to emphasize the biologic basis of diseases of the skin, sexually transmitted diseases and leprosy

11. PSYCHIATRY

a. Competencies: The student must demonstrate:

- Ability to promote mental health and mental hygiene,
- Knowledge of etiology (bio-psycho-social-environmental interactions), clinical features, diagnosis and management of common psychiatric disorders across all ages,
- Ability to recognize and manage common psychological and psychiatric disorders in a primary care setting, institute preliminary treatment in disorders difficult to manage, and refer appropriately,
- Ability to recognize alcohol/ substance abuse disorders and refer them to appropriate centers,
- Ability to assess risk for suicide and refer appropriately,
- Ability to recognize temperamental difficulties and personality disorders,
- Assess mental disability and rehabilitate appropriately.



- Understanding of National and State programmes that address mental health and welfare of patients and community.

b. Broad subject specific objectives:

Knowledge: At the end of the course the student shall be able to:

- Understand the comprehensive nature & development of different aspects of normal human behavior like learning, memory, motivation, personality & intelligence
- Recognize differences between normal & abnormal behavior
- Classify psychiatric disorders
- Recognize clinical manifestations of the following common syndromes & plan their appropriate management of organic psychosis, functional psychosis, schizophrenia, affective disorders, neurotic disorders, personality disorders, psycho physiological disorders, drug & alcohol dependence, psychiatric disorders of childhood & adolescence
- Describe rational use of different mode of therapy in psychiatric disorders.

c. Skills: The student shall be able to:

- Interview the patient & understand different methods of communications in patient-doctor relationship
- Elicit detailed psychiatric case history & conduct clinical examination for assessment of mental status
- Define, elicit & interpret psychopathological symptoms & signs
- Diagnose & manage common psychiatric disorders
- Identify & manage common psychological reactions & psychiatric disorders in medical & surgical patients in clinical practice & in community setting

d. Integration: The teaching should be aligned and integrated horizontally and vertically in order to allow the student to understand bio-psycho-social-environmental interactions that lead to diseases/ disorders for preventive, promotive, curative, rehabilitative services and medico-legal implications in the care of patients both in family and community.

12. RESPIRATORY MEDICINE

a. Competencies: The student must demonstrate:

- Knowledge of common chest diseases, their clinical manifestations, diagnosis and management,
- Ability to recognize, diagnose and manage pulmonary tuberculosis as contemplated in National Tuberculosis Elimination programme,



- Ability to manage common respiratory emergencies in primary care setting and refer appropriately.

b. Broad subject specific objectives:

Knowledge: At the end of the course of Pulmonary Medicine, the student shall be able to:

- Demonstrate sound knowledge of common chest diseases, their manifestations, including emergency situations and of investigative procedures to confirm their diagnosis.
- Demonstrate comprehensive knowledge of various modes of therapy used in treatment of respiratory diseases.
- Describe the modes of action of commonly used drugs, their doses, side effects/toxicity, indications and contra indications and interactions.
- Describe commonly used modes of management including medical and surgical procedures available for treatment of various diseases and to offer a comprehensive plan of management inclusive of Revised National Tuberculosis Control programme.

c. Skills : The student shall be able to :

- Interview the patient, elicit relevant and correct information and describe the history in chronological order;
- Conduct clinical examination, elicit and interpret clinical findings and diagnose common respiratory disorders and emergencies;
- Perform simple, routine investigative and office procedures required for making the bed side diagnosis especially sputum collection and examination for etiologic organisms especially Acid fast Bacilli (AFB), interpretation of the chest x-rays and respiratory function tests;
- Interpret and manage various blood gases and PH abnormalities in various respiratory diseases;
- Manage common diseases recognizing need for referral for specialized care, in case of inappropriateness of therapeutic responses;
- Assist in the performance of common procedures, like laryngoscopic examination, pleural aspiration, respiratory physiotherapy, laryngeal intubation and pneumo-thoracic drainage/aspiration

- d. **Integration:** The teaching should be aligned and integrated horizontally and vertically in order to allow the student to recognize diagnose and treat TB and other lung diseases in the context of the society, national health priorities, drug resistance and co-morbid conditions like HIV.



13. PEDIATRICS

a. Competencies: The student must demonstrate:

- Ability to assess and promote optimal growth, development and nutrition of children and adolescents and identify deviations from normal,
- Ability to recognize and provide emergency and routine ambulatory and First Level Referral Unit care for neonates, infants, children and adolescents and refer as may be appropriate,
- Ability to perform procedures as indicated for children of all ages in the primary care setting,
- Ability to recognize children with special needs and refer appropriately,
- Ability to promote health and prevent diseases in children,
- Ability to participate in National Programmes related to child health and in conformation with the Integrated Management of Neonatal and Childhood Illnesses (IMNCI) Strategy,
- Ability to communicate appropriately and effectively.

b. Broad subject specific objectives:

Knowledge:-At the end of the course, the students shall be able to:-

- Describe the normal Growth and Development during fetal life, Neonatal period, Childhood and Adolescence and the deviations thereof.
- Describe the common Pediatric disorders and emergencies in terms of Epidemiology, Etiopathogenesis, Clinical manifestations, Diagnosis and also describe the rational therapy and rehabilitation services.
- Workout age related requirements of calories, nutrients, fluids, dosages of drugs etc. in health and disease.
- Describe preventive strategies for common infectious disorders, Malnutrition, Genetic and Metabolic disorders, Poisonings, Accidents and Child abuse.
- Outline national programs related to child health including Immunization programs.

c. Skills : At the end of the course, the students shall be able to:-

- Take detailed Pediatric and Neonatal history and conduct an appropriate physical examination of children and neonates, make clinical diagnosis, conduct common bedside investigative procedures, interpret common laboratory investigations, plan and institute therapy.
- Take anthropometric measurements, resuscitate newborn, prepare oral rehydration solution, perform tuberculin test, administer vaccines available under current National programs, perform venesection, start intravenous fluids and provide nasogastric feeding.



- Conduct diagnostic procedures such as lumbar puncture, liver and kidney biopsy, bone marrow aspiration, pleural and ascitic tap.
 - Distinguish between normal Newborn babies and those requiring special care and institute early care to all newborn babies including care of preterm and low birth weight babies, provide correct guidance and counseling about breastfeeding and Complementary feeding.
 - Provide ambulatory care to all not so sick children, identify indications for specialized/ inpatient care and ensure timely referral to those who require hospitalization.
- d. **Integration:** The teaching should be aligned and integrated horizontally and vertically in order to provide comprehensive care for neonates, infants, children and adolescents based on a sound knowledge of growth, development, disease and their clinical, social, emotional, psychological correlates in the context of national health priorities.

14. GENERAL SURGERY

a. **Competencies:** The student must demonstrate:

- Understanding of the structural and functional basis, principles of diagnosis and management of common surgical problems in adults and children
- Ability to choose, calculate and administer appropriately intravenous fluids, electrolytes, blood and blood products based on the clinical condition
- Ability to apply the principles of asepsis, sterilization, disinfection, rational use of prophylaxis, therapeutic utilities of antibiotics and universal precautions in surgical practice
- Knowledge of common malignancies in India and their prevention, early detection and therapy
- Ability to perform common diagnostic and surgical procedures at the primary care level
- Ability to recognize, resuscitate, stabilize and provide Basic & Advanced Life Support to patients following trauma
- Ability to administer informed consent and counsel patient prior to surgical procedures,
- Commitment to advancement of quality and patient safety in surgical practice.

b. **Broad subject specific objectives.**

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

- Describe aetiology, pathophysiology, principles of diagnosis and management of common surgical problems including emergencies in adult and children.
- Define indications and methods for fluid and electrolytes replacement therapy



including blood transfusion.

- Define asepsis, disinfection and sterilization and recommend judicious use of antibiotics.
- Describe common malignancies in the country and their management including prevention.
- Enumerate different types of anaesthetic agents, their indications, contraindications, mode of administration, and side effects.

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

- Diagnose common surgical conditions both acute and chronic, in adults and children.
- Plan various laboratory tests for surgical conditions and interpret the results.
- Identify and manage patients of hemorrhagic, septicemia and other types of shock.
- Be able to maintain patent air-way and resuscitate.
- Monitor patient of head, chest, spinal and abdominal injuries, both in adults and children.
- Provide primary care for a patient of burns.
- Acquire principles of operative surgery including preoperative, operative and post operative care and monitoring.
- Treat open wound including preventive measures against tetanus and gas gangrene.
- Diagnose neonatal and pediatric surgical emergencies and provide sound primary care before referring the patient to secondary/tertiary centres.
- Identify congenital anomalies and refer them for appropriate management.

d. Integration: The teaching should be aligned and integrated horizontally and vertically in order to provide a sound biologic basis and a holistic approach to the care of the surgical patient.

- Apply knowledge of basic medical sciences and other relevant subjects to support understanding of various pathologies, facilitate examination of and intervention for the patients.
- To apply the principles of quality of health care, legal and ethical principles and regulations as recommended by Medical Council of India and WHO.

15. ORTHOPAEDICS (INCLUDING PHYSICAL MEDICINE & REHABILITATION)

a. Competencies: The student must demonstrate:

- Ability to recognize and assess bone injuries, dislocation and poly-trauma and provide first contact care prior to appropriate referral.



- Knowledge of the medico-legal aspects of trauma,
- Ability to recognize and manage common infections of bone and joints in the primary care setting,
- Recognize common congenital, metabolic, neoplastic, degenerative and inflammatory bone diseases and refer appropriately,
- Ability to perform simple orthopedic techniques as applicable to a primary care setting,
- Ability to recommend rehabilitative services for common orthopaedic problems across all ages.

b. Broad subject specific objectives

Knowledge: The student shall be able to understand:

- The principles, diagnosis and primary management and be able to give appropriate referral for further definitive management of bones and joint injuries.
- Osteogenesis, manifestation and diagnosis, primary management and give their referral for appropriate correction or rehabilitation of common musculoskeletal disorders including infections of bones and joints; congenital skeletal anomalies, metabolic bone diseases and neoplasm affecting bones.

c. Skills : At the end of the course, the student shall be able to:

- Detect soft tissue injuries such as sprains and strains.
- Detect common fractures of extremities.
- Deliver first aid measures for common fractures and sprains.
- Deliver emergency measures to poly trauma patients.
- Manage uncomplicated fractures of clavicle, forearm, phalanges etc.
- Use techniques of splinting such as application of Thomas splint, plaster slab and casts, immobilization by skin tractions etc.
- Learn indications for closed reductions, open reductions, internal fixation and external fixations of fracture.
- Manage common bone infection; learn indications for sequestration, amputation and corrective measures for bone deformities.
- Advice and counsel patient for rehabilitation for post traumatic, poliomyelitis, cerebral palsy and amputation.
- Be able to perform certain orthopedic skills, provide sound advice of skeletal and related conditions at primary or secondary health care level.

d. Integration: The teaching should be aligned and integrated horizontally and vertically in order to allow the student to understand the structural basis of orthopedic problems, their management and correlation with function, rehabilitation and quality of life.



16. ANAESTHESIOLOGY

a. Competencies: The student must demonstrate ability to:

- Describe and discuss the pre-operative evaluation, assessing fitness for surgery and the modifications in medications in relation to anesthesia /surgery,
- Describe and discuss the roles of Anesthesiologist as a peri-operative Physician including pre-medication, endotracheal intubation, general anesthesia and recovery (including variations in recovery from anesthesia and anaesthetic complications),
- Describe and discuss the management of acute and chronic pain, including labour analgesia,
- Demonstrate awareness about the maintenance of airway in children and adults in various situations,
- Demonstrate the awareness about the indications, selection of cases and execution of cardio- pulmonary
- Resuscitation in emergencies and in the intensive care and high dependency units,
- Choose cases for local / regional anesthesia and demonstrate the ability to administer the same,
- Discuss the implications and obtain informed consent for various procedures and to maintain the documents.

b. Broad subject specific objectives:

Knowledge: At the end of the course, the student shall be able to :

- Know of simple nerve block and pain relief
- Awareness of the principles of administration of general, regional and local anesthesia.
- Know importance of hypoglycemia/hyperglycemia, hypotension/hypertension, IHD, Myocardial infarction.
- Know ventilators.

c. Skills : At the end of the training, the students should be able to:

- Perform cardio-pulmonary resuscitation with the available resources and transfer the patients to a bigger hospital for advanced life support.
- Set up intravenous infusion and manage fluid therapy
- Clear and maintain airway in unconscious patient.
- Administer oxygen correctly

d. Integration: The teaching should be aligned and integrated horizontally and vertically in order to provide comprehensive care for patients undergoing various surgeries, in patients



with pain, in intensive care and in cardio respiratory emergencies. Integration with the preclinical department of Anatomy, para- clinical department of Pharmacology and horizontal integration with any/all surgical specialties is proposed.

17. RADIODIAGNOSIS

a. Competencies: The student must demonstrate:

- Understanding of indications for various radiological investigations in common clinical practice,
- Awareness of the ill effects of radiation and various radiation protective measures to be employed,
- Ability to identify abnormalities in common radiological investigations.

b. Broad subject specific objectives:

Knowledge: At the end of the course, the student shall be able to :

- Enlist and describe the various diagnostic modalities
- Delineate normal and abnormal radiological findings
- Understand basic radiology and emphasize on its clinical applications
- Describe radiographic, ultra sonographic, CT, MRI features of common pathologies.
- Describe and integrate radiological findings in CNS, GIT, RS, CVS, MSK, GUT

c. Skills At the end of the course, the student shall be able to:

- Make use of Imaging findings to reach to a diagnosis;
- Analysis and interpret radiological data;
- Demonstrate the skills of solving clinical problems by illustrative evidences and decision making.

d. Integration: Horizontal and vertical integration to understand the fundamental principles of radiologic imaging, anatomic correlation and their application in diagnosis and therapy

18. OTO-RHINOLARYNGOLOGY (ENT)

a. Competencies: The learner must demonstrate :

- Knowledge of the common Otorhinolaryngological (ENT) emergencies and problems,
- Ability to recognize, diagnose and manage common ENT emergencies and problems in primary care setting,



- Ability to perform simple ENT procedures as applicable in a primary care setting.
- Ability to recognize hearing impairment and refer to the appropriate hearing impairment rehabilitation programme.

b. Broad subject specific objectives:

Knowledge: At the end of the course, the student shall be able to :

- Describe the basic pathophysiology of common Ear, Nose & Throat (ENT) diseases & emergencies.
- Adopt the rational use of commonly used drugs keeping in mind their adverse reactions.
- Suggest common investigative procedures & their interpretation.

c. Skills: At the end of the course the student shall be able to :

- Examination & Diagnose common ENT problems including pre-malignant & Malignant disorders of the Head & Neck.
- Manage ENT problems at first level of care & be able to refer whenever necessary.
- Assist / carry out minor ENT procedures like ear syringing, ear dressing, nasal packing.
- Assist in certain procedures such as tracheotomy, endoscopy & removal of foreign bodies.

d. Integration: The teaching should be aligned and integrated horizontally and vertically in order to allow the learner to understand the structural basis of ENT problems, their management and correlation with function, rehabilitation and quality of life. The undergraduate training ENT will provide an integrated approach towards other disciplines especially, neurosciences, ophthalmology & general surgery.

19. OPHTHALMOLOGY

a. Competencies: The student must demonstrate:

- Knowledge of common eye problems in the community
- Recognize, diagnose and manage common eye problems and identify indications for referral,
- Ability to recognize visual impairment and blindness in the community and implement national programmes as applicable in the primary care setting.

b. Broad subject specific objectives

Knowledge: At the end of the course, student shall have the knowledge of



- Common problems affecting the eye.
- Principles of management of major ophthalmic emergencies.
- Main systemic disease affecting the eye.
- Effects of local and systemic diseases on patient's vision and the necessary action required minimizing the sequelae of such diseases.
- Adverse drug reaction with special reference to ophthalmic manifestations.
- Magnitude of blindness in India and its main causes.
- National programme for control of blindness and its implementation at various levels.
- Eye care education for prevention of eye problems.
- Role of primary health center in organization of eye camps.
- Organization of primary health care and the functioning of the ophthalmic assistant.
- Integration of the national programme for control of blindness with the other national health programmes.
- Eye bank organization.

c. Skills

- Elicit a history pertinent to general health and ocular status.
- Assist in diagnostic procedures such as visual acuity testing, examination of eye, Schiotz tonometry, Staining of Corneal pathology, confrontation, perimetry, Subjective refraction including correction of Presbyopia and aphakia, direct ophthalmoscopy and conjunctival smear examination and Cover test.
- Diagnose and treat common problems affecting the eye.
- Interpret ophthalmic signs in relation to common systemic disorders.
- Assist/observe therapeutic procedures such as Subconjunctival injection, corneal conjunctival foreign body removal, carbolic cautery for corneal ulcers, Nasolacrimal duct syringing and tarsorrhaphy
- Provide first aid in major ophthalmic emergencies.
- Assist to organize community surveys for visual check-up.
- Assist to organize primary eye care service through primary health centers.
- Use effective means of communication with the public and individual to motivate for surgery in cataract and for eye donation.
- Establish rapport with his seniors, colleagues and paramedical workers, so as to effectively function as a member of the eye care team.

- d. **Integration:** The teaching should be aligned and integrated horizontally and vertically in order to allow the student to understand the structural basis of ophthalmologic problems, their management and correlation with function, rehabilitation and quality of life.



20. OBSTETRICS AND GYNAECOLOGY

a. Competencies: The student must demonstrate ability to:

- Provide peri-conceptional counseling and ante natal care,
- Identify high-risk pregnancies and refer appropriately,
- Conduct normal deliveries, using safe delivery practices in the primary and secondary care settings,
- Prescribe drugs safely and appropriately in pregnancy and lactation,
- Diagnose complications of labor, institute primary care and refer in a timely manner,
- Perform early neonatal resuscitation,
- Provide postnatal care, including education in breast-feeding,
- Counsel and support couples in the correct choice of contraception,
- Interpret test results of laboratory and radiological investigations as they apply to the care of the obstetric patient,
- Apply medico-legal principles as they apply to tubectomy, Medical Termination of Pregnancy (MTP), Pre-conception and Prenatal Diagnostic Techniques (PC PNDT Act) and other related Acts.
- Elicit a gynecologic history, perform appropriate physical and pelvic examinations and PAP smear in the primary care setting,
- Recognize, diagnose and manage common reproductive tract infections in the primary care setting,
- Recognize and diagnose common genital cancers and refer them appropriately.

b. Broad subject specific objectives

Knowledge : At the end of the course, the student shall be able to:

- Outline the anatomy, physiology and pathophysiology of the reproductive system and the common conditions affecting it.
- Diagnose normal pregnancy, labour, puerperium and manage the problems he is likely to encounter therein.
- List of leading causes of maternal and perinatal morbidity and mortality.
- Understand the principles of contraception and various techniques employed, methods of medical termination of pregnancy, sterilization and their complications.
- Identify the use, abuse and side effects of drugs in pregnancy, peri- menopausal and post-menopausal periods.
- Describe the national programme of maternal and child health and family welfare and their implementation at various levels.
- Identify common gynecological diseases and describe principles of their management.



- State the indications, techniques and complications of surgeries like Caesarian section, laparotomy, abdominal and vaginal hysterectomy, Fothergill's operation and vacuum
- Aspiration for Medical Termination of pregnancy (MTP) and minor surgeries like EB, D and C, Cervical Biopsy and Cervical encircage.

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

- Take proper history and writing a good case sheet
- Writing a good discharge summary, proper referral letter
- Examination of patient and arrival at a diagnosis
- Planning for investigation and treatment
- Community orientation, participation in community health promoting and preventing programmes
- Examine a pregnant woman, recognize high- risk pregnancies and make appropriate referrals.
- Conduct a normal delivery, plot and inter pretepartogram
- Recognize complications and decision of referral, provide postnatal care,
- Resuscitate the newborn and recognize the congenital anomalies.
- Advise a couple on the use of various available contraceptive devices (student should see at least 5 Cu-Tinsertions and 5 cases of female sterilization operations.)
- Perform pelvic examination, diagnose and manage common. gynecological problems including early detection of genital malignancies.
- Make a vaginal cytological smear, perform a post coital test and wet vaginal smear examination for Trichomonas vaginalis, Moniliasis and gram stain for gonorrhea, catheterization of urinary bladder
- Interpretation of data of investigations like biochemical, histopathological, radiological ultrasound etc.

d. Integration: The teaching should be aligned and integrated horizontally and vertically in order to provide comprehensive care for women in their reproductive years and beyond, based on a sound knowledge of structure, functions and disease and their clinical, social, emotional, psychological correlates in the context of national health priorities. The student shall be able to integrate clinical skills with other disciplines and bring about coordination of family welfare programme for the national goal of population control.



B. PHASE WISE TRAINING AND TIME DISTRIBUTION FOR PROFESSIONAL DEVELOPMENT

The Competency based Undergraduate Curriculum and Attitude, Ethics and Communication (AETCOM) course, as published by the Medical Council of India and also made available on the Council's website, shall be the curriculum for the batches admitted in MBBS from the academic year 2019-20 onwards.

In order to ensure that training is in alignment with the goals and competencies required for a medical graduate, there shall be a **Foundation Course** to orient medical learners to MBBS programme, and provide them with requisite knowledge, communication (including electronic), technical and language skills.

I. Training period and time distribution:

Universities shall organize admission timing and admission process in such a way that teaching in the first Professional year commences with induction through the Foundation Course by the 1st of August of each year. There shall be no admission of students in respect of any academic session beyond 30th August under any circumstance. The Universities shall not register any student admitted beyond the said date.

The National Medical Commission may direct, that any student identified as having Obtained admission after the last date for closure of admission be discharged from the Course of study, or any medical qualification granted to such a student shall not be a recognized qualification by National Medical Commission.

The institution which grants admission to any student after the last date specified from the same shall also be liable to face such action as may be prescribed by National Medical Commission.

Every learner shall undergo a period of certified study extending over 4 ½ academic years, divided into four professional years from the date of commencement of course to the date of completion of examination which shall be followed by one year of compulsory rotating internship.

Each academic year will have at least 39 teaching weeks with a minimum of eight hours of working on each day including one hour as lunch break.

Didactic lectures shall not exceed one third of the schedule; two third of the schedule shall include interactive sessions, practicals, clinical or/and group discussions. The learning process should include clinical experiences, problem- oriented approach, case studies and community health care activities.



Teaching and learning shall be aligned and integrated across specialties both vertically and horizontally for better learner comprehension. Learner centered learning methods should include Early Clinical Exposure, problem-oriented learning, case studies, community- oriented learning, self- directed, experiential learning& Electives.

At the end of each professional year University examination will be conducted. If any student fails to clear University examination, he will appear in supplementary examination.

Supplementary examinations and declaration of results shall be processed within 3-6 weeks from the date of declaration of the results of the main examination for every professional year, so that the candidates, who pass, can join the main batch for progression.

If the candidate fails in the supplementary examination of first MBBS, he shall join the batch of next academic /subsequent year. There shall be no supplementary batches. Partial attendance of examination in any subject shall be counted as an attempt.

- A candidate, who fails in the First Professional examination, shall not be allowed to join the Second Professional.
- A candidate, who fails in the second Professional examination, shall be allowed to join the third Professional Part I training, however he shall not be allowed to appear for the examination unless he has passed second professional examination.
- A candidate who fails in the third Professional (Part I) examination shall be allowed to join third Professional part II training, however he shall not be allowed to appear for the examination unless he has passed second professional examination.

II. The period of 4½ years is divided as follows:

Phase I –Total 12 months

i) First Professional phase of 12 months including Foundation Course of one week and University exams.

It shall consist of preclinical subjects – Anatomy, Physiology, Biochemistry, Introduction to Community Medicine, Humanities, Professional development including Attitude, Ethics & Communication (AETCOM) module, family adoption programme through village outreach, Pandemic module and early clinical exposure, ensuring alignment & all types of integration and simulation-based learning.



Phase II- Second Professional (12 months) including University exam.

It will consist of Pathology, Pharmacology, Microbiology, family visit under Community Medicine, General Surgery, General Medicine & Obstetrics & Gynecology Professional development including AETCOM module, simulation-based learning and introduction to clinical subjects ensuring both alignment & all types of integration.

The clinical exposure to learners will be in the form of learner-doctor method of clinical training in all phases. The emphasis will be on primary, preventive and comprehensive health care. A part of training during clinical postings should take place at the *primary level* of health care. It is desirable to provide learning experiences in secondary health care, wherever possible. This will involve:

- Experience in recognizing and managing common problems seen in outpatient, inpatient and emergency settings,
- Involvement in patient care as a team member,
- Involvement in patient management and performance of basic procedures.

iii) Phase III - 30 months

a. Third Professional Part I (12 months, including University exams)

Forensic Medicine and Toxicology, Community Medicine, Medicine & allied, Surgery & allied, Pediatrics and Obstetric & Gynecology including AETCOM, Pandemic module, Clinical teaching in General Medicine, General Surgery, Obstetrics & Gynecology, Pediatrics, Orthopedics, Dermatology, Community Medicine, Psychiatry, Respiratory Medicine, Radio-diagnosis (& Radiotherapy) and Anesthesiology & Professional development.

b. Electives (1 month) shall be included here. These will be in 2 blocks of 15 days each in Final first; 1st block after annual exam of III MBBS part 1 and 2nd block after the end of 1st elective.

c. Third Professional Part II (18 months, including University exam)

Subjects include:

- Medicine and allied specialties (General Medicine, Psychiatry, Dermatology (including Venereology and Leprosy, Respiratory Medicine (including Tuberculosis))
- Surgery and allied specialties (General Surgery, Otorhinolaryngology, Ophthalmology, Orthopedics, Dentistry, Physical Medicine and rehabilitation, Anesthesiology and Radiodiagnosis)
- Obstetrics and Gynecology (including Family Welfare)
- Pediatrics
- AETCOM module



III. Distribution of teaching hours phase wise

a. First, second and third Professional part-I, teaching hours:

Time allotted : 12 months (approx. 52 weeks)
Time available : Approx. **39 weeks** (excluding 13 weeks) (39 hours/ week)

Prelim / University Exam & Results: 9 weeks
Vacation: 2 weeks
Public Holidays: 2 weeks

Time distribution in weeks: 39 weeks x 39 hours = 1521 available hours for Teaching- Learning

b. Final MBBS part-2, teaching hours:

Time allotted : 18 months (approx. 78 weeks)
Time available : Approx. **62 weeks** (excluding 16 weeks) (39 hours/ week)

Prelim / University Exam & Results: 10 weeks
Vacation: 3 weeks
Public Holidays: 3 weeks

Time distribution in weeks: 62 x 39 hrs = 2418 hrs available hours for Teaching- Learning

(Clinical Postings: 15 hours/ week II MBBS onwards included in academic schedule)

These are attached in sperate annexure with all relevant tables.

- ❖ Academic calendar shall be as per the Table 1.
- ❖ Distribution of subjects for Professional Phase – wise training is given in Table 2.
- ❖ Minimum teaching hours prescribed in various disciplines are given in Tables 3-7.
- ❖ Distribution and duration of clinical postings is given in Table 8.

Time allotted excludes time reserved for internal /University examinations, and vacation.

Second professional clinical postings shall commence before / after declaration of results of the first professional phase examinations, as decided by the institution/ University.

Third Professional parts I and part II clinical postings shall start no later than two weeks after the completion of the previous professional examination.



A total of 25% of allotted time of third Professional shall be utilized for integrated learning with phase I and II subjects. This will be included in the assessment of clinical subjects.

Note :

- The period of training is minimum suggested. Adjustments where required depending on availability of time may be made by the concerned college/ institution. This period of training does not include University examination period.
- An exposure to skills lab for at least two (02) weeks prior to clinical postings shall be made available to all student.

C) New teaching /learning elements

1) Foundation Course

Goal: The goal of the Foundation Course is to prepare a learner to study medicine effectively.

Objectives:

(a)

Orient the learner to:

- The medical profession and the Physician's role in society
- The MBBS programme
- Alternate health systems i.e. AYUSH in India and history of Medicine
- Medical ethics, attitudes and professionalism
- Health care system and its delivery
- National health programmes and policies
- Universal precautions and vaccinations
- Patient safety and biohazard safety
- Principles of primary care (general and community based care)
- The academic ambience

(b) Enable the learner to acquire enhanced skills in:

- Language
- Interpersonal relationships
- Communication
- Learning including self-directed learning
- Time management
- Stress management
- Use of information technology, and artificial intelligence

(c) Train the learner to provide:

- First-aid
- Basic life support



- In addition to the above, learners maybe enrolled in one of the following programmes which will be run concurrently:
- Local language programme
- English language programme
- Computer skills

These may be done in the last two hours of the day. These sessions must be as interactive as possible.

Sports (to be used through the Foundation Course as protected 04 hours /week).

Leisure and extracurricular activity (to be used through the Foundation Course as projected 02 hours per week).

Institutions shall develop learning modules and identify the appropriate resource persons for their delivery.

The time committed for the Foundation Course may not be used for any other curricular activity.

The Foundation Course shall have a minimum of 75% attendance of all students mandatorily. This will be certified by the Dean of the college.

The Foundation Course shall be organized by the Coordinator appointed by the Dean of the college and shall be under supervision of the Heads of MBBS phase I departments.

Every college shall arrange for a meeting with parents/ wards of all students and records of the same shall be made available to UGMEB of NMC.

2) Early Clinical Exposure

Objectives: The objectives of early clinical exposure of the first-year medical learners are to enable the learner to:

- Recognize the relevance of basic sciences in diagnosis, patient care and management,
- Provide a context that will enhance basic science learning,
- Relate to experience of patients as a motivation to learn,
- Recognize attitude, ethics and professionalism as integral to doctor-Patient relationship,
- Understand the socio-cultural context of disease through the study of humanities.



- Elements
- Basic science correlation: i.e. apply and correlate principles of basic sciences as they relate to patient care (this shall be part of integrated modules).
- Clinical skills: to include basic skills in interviewing patients, doctor-patient communication, ethics and professionalism, critical thinking and analysis and self-learning (this training shall be imparted in the time allotted for early clinical exposure).
- Humanities: To introduce learners to a broader understanding of the socio-economic framework and cultural context within which health is delivered through the study of humanities and social sciences.

3) Electives

Objectives: To provide the learner with opportunities:

- For diverse learning experiences,
- It is mandatory for learners to do an elective. The elective time shall not be used to make up for missed clinical postings, shortage of attendance or other purposes.
- Institutions will pre-determine the number and nature of electives, names of the supervisors, and the number of learners in each elective based on the local conditions, available resources and faculty.
-
- Electives on topics in areas such as Research methodology, Use of Artificial intelligence and computers in Health and Medical Education, Health Management, Health economics, Indian system of medicine, Medical photography /clinical photography, Global health, Evidence based medicine, Art and music in medicine, Literary activities, etc. may be provided by the college/ institution.
- It shall be preferable that elective choices are made available to the learners in the beginning of the academic year.
- The learner must submit a learning log book based on both blocks of the electives.
- 75% attendance in the electives and submission of log book maintained during electives is required for eligibility to appear in the final MBBS examination/ NEXT.
- Institutions may use part of this time for strengthening basic skill certification.



4) Professional Development including Attitude, Ethics and Communication Module (AETCOM)

Objectives of the programme : At the end of the programme, the learner must demonstrate ability to:

- Understand and apply principles of bioethics and law as they apply to medical practice and research, understand and apply the principles of clinical reasoning as they apply to the care of the patients,
- Understand and apply the principles of system-based care as they relate to the care of the patient,
- Understand and apply empathy and other human values to the care of the patient,
- Communicate effectively with patients, families, colleagues and other health care professionals,
- Understand the strengths and limitations of alternative systems of medicine,
- Respond to events and issues in a professional, considerate and humane fashion,
- Translate learning from the humanities in order to further his professional and personal growth.

Learning experiences:

- This will be a longitudinal programme spread across the continuum of the MBBS programme including internship,
- Learning experiences shall include small group discussions, patient care scenarios, workshops, seminars, role plays, lectures etc.
- Attitude, Ethics & Communication Module (AETCOM module) developed by the erstwhile Medical Council of India should be used longitudinally for purposes of instruction.
- 75% attendance in Professional Development Programme (AETCOM Module) shall be mandatory for eligibility to appear for final examination in each professional year.

Internal Assessment shall include:

- Written tests comprising of short notes and creative writing experiences,
- OSCE based clinical scenarios /viva voce.
- At least one question in each paper of each clinical specialty in the University examination shall test knowledge competencies acquired during the professional development programme.
- Skill competencies acquired during the Professional Development Programme must be tested during the clinical, practical and viva voce.



5) Learner-doctor method of clinical training (Clinical Clerkship)

a. Goal: To provide learners with experience in:

- Longitudinal patient care,
- Being part of the health care team,
- Hands-on care of patients in outpatient and in-patient setting.

b. Structure:

- The first clinical posting in second professional shall orient learners to the patient, their roles and the specialty.
- The learner-doctor programme shall progress as outlined in Table 9.
- The learner shall function as a part of the health care team with the following responsibilities:
 - Be a part of the units' out-patient services on admission days,
 - Remain with the admission unit until at least 6 PM except during designated class hours,
 - Be assigned patients admitted during each admission day for whom he will undertake responsibility, under the supervision of a senior resident or faculty member,
 - Participate in the unit rounds on its admission day and will present the assigned patients to the supervising Physician,
- Follow the patient's progress throughout the hospital stay until discharge,
- Participate, under supervision, in procedures, surgeries, deliveries etc. of assigned patients,
- Participate in unit rounds on at least one other day of the week excluding the admission day,
- Discuss ethical and other humanitarian issues during unit rounds,
- Attend all scheduled classes and educational activities,
- Document his observations in a prescribed log book /case record.

No learner will be given independent charge of the patient in the capacity of primary Physician of the concerned patient.

The supervising Physician shall be responsible for all patient care decisions and guide the learner from time to time as required.

6) Assessment:

- A designated faculty member in each unit will coordinate and facilitate the



activities of the learner, monitor progress, provide feedback and review the log book/ case record.

- The log book/ case record must include the written case record prepared by the learner including relevant investigations, treatment and its rationale, hospital course, family and patient discussions, discharge summary etc.
- The log book shall also include records of outpatients assigned. Submission of the log book/ case record to the department is required for eligibility to appear for the final examination of the subject.

I. Eligibility to appear for Professional examinations

The performance in essential components of training are to be assessed, based on:

(a) Attendance

- There shall be a minimum of 75% attendance in theory and 80% in practical /clinical for eligibility to appear for the examinations in that subject. In subjects that are taught in more than one phase – the learner must have 75% attendance in theory and 80% in practical in each phase of instruction in that subject. There shall be minimum of 80% attendance in family visits under Family adoption programme.
- If an examination comprises more than one subject (for e.g., General Surgery and allied branches), the candidate must have a minimum of 75% attendance in each subject including its allied branches, and 80% attendance in each clinical posting.
- Learners who do not have at least 75% attendance in the electives will not be eligible for the Third Professional - Part II examination/ NEXT.

(b) Internal Assessment: Internal assessment shall be based on day-to-day assessment. It shall relate to different ways in which learners participate in learning process including assignments, preparation for seminar, clinical case presentation, preparation of clinical case for discussion, clinical case study/ problem solving exercise, participation in project for health care in the community. Internal assessment shall not be added to summative assessment. However, internal assessment should be displayed under a separate column in detailed marks card.

(c) Learners must have completed the required certifiable competencies for that phase of training and completed the log book appropriate for that phase of training to be eligible for appearing at the final University examination of that subject.

(d) Regular periodic examinations shall be conducted throughout the course. There shall be no less than three internal assessment examinations in each subject of first and second professional year, and no less than two examinations in each subject of final professional



year. An end of posting clinical assessment shall be conducted for each clinical posting in each professional year.

- When subjects are taught in more than one phase, the internal assessment must be done in each phase and must contribute proportionately to final assessment. For example, General Medicine must be assessed in second Professional, third Professional Part I and third Professional Part II, independently.
- Day to day records and log book (including required skill certifications) should be given importance in internal assessment. Internal assessment should be based on competencies and skills.
- The final internal assessment in a broad clinical specialty (e.g., Surgery and allied specialties etc.) shall comprise of marks from all the constituent specialties. The proportion of the marks for each constituent specialty shall be determined by the time of instruction allotted to each.
- Learners must secure at least 50% marks of the total marks (combined in theory and practical / clinical; not less than 40% marks in theory and practical separately) for internal assessment in a particular subject in order to be eligible for appearing at the final University examination of that subject. Internal assessment marks will reflect as separate head of passing at the summative examination.
- The results of internal assessment should be displayed on the notice board within one week of the test.
- Universities shall guide the colleges regarding formulating policies for remedial measures for students who are either not able to score qualifying marks or have missed on some assessments due to any reason.

II. University Examinations:

University examinations are to be designed with a view to ascertain whether the candidate has acquired the necessary knowledge, minimal level of skills, ethical and professional values with clear concepts of the fundamentals which are necessary for him to function effectively and appropriately as a Physician of the first contact. Assessment shall be carried out on an objective basis to the extent possible.

- Nature of questions shall include different types such as structured assays (Long-Answer Questions -LAQ), Short-Answer Questions (SAQ) and objective type questions (e.g. Multiple Choice Questions - MCQ). Marks for each part shall be indicated separately. MCQs shall be accorded a weightage of not more than 20% of the total theory marks. In subjects that have two papers, the learner must secure minimum 50% of marks in aggregate (both papers together) to pass.
- Practical /clinical examinations shall be conducted in the laboratories and /or hospital wards. The objective will be to assess proficiency and skills to conduct experiments, interpret data and form logical conclusion. Clinical cases kept in the examination must be common conditions that the learner may encounter as a



Physician of first contact in the community. Selection of rare syndromes and disorders as examination cases is to be discouraged. Emphasis should be on candidate's capability to elicit history, demonstrate physical signs, write a case record, analyze the case and develop a management plan.

- Viva/oral examination should assess approach to patient management, emergencies, and attitudinal, ethical and professional values. Candidate's skill in interpretation of common investigative data, X-rays, identification of specimens, ECG, etc. is to be also assessed.

University Examinations shall be held as under:

(a) First Professional

The first Professional examination shall be held at the end of first Professional training (in the 12th month of that training), in the subjects of Anatomy, Physiology and Biochemistry.

(b) Second Professional

The second Professional examination shall be held at the end of second professional training (12th month of that training), in the subjects of Pathology, Microbiology, and Pharmacology.

(c) Third Professional

- Third Professional Part I examination shall be held at end of third Professional part I of training (12th month of that training) in the subjects of Community Medicine, and Forensic Medicine including Toxicology
- Third Professional Part II / National Exit Test (NExT) as per NExT regulations- (Final Professional) examination shall be at the end of 17th / 18th month of that training, in the subjects of General Medicine, General Surgery, Ophthalmology, Otorhinolaryngology, Obstetrics & Gynecology, and Pediatrics, and allied subjects as per NExT REGULATIONS.



Note:

- At least one question in each paper of each PHASE shall test the knowledge, and competencies acquired during the professional development programme (AETCOM module).
- Skills competencies acquired during the Professional Development Programme (AETCOM module) shall be tested during clinical, practical and viva.

In subjects that have two papers, the learner must secure minimum 50% of marks in aggregate (both papers together) to pass in the said subject.

Criteria for passing in a subject: A candidate shall obtain 50% marks in University conducted examination separately in Theory and in Practical (practical includes: practical/ clinical and viva voce) in order to be declared as passed in that subject.

Appointment of Examiners

- Person appointed as an examiner in the particular subject must have at least four years of total teaching experience as Assistant Professor after obtaining postgraduate degree in the subject in a college affiliated to a recognized medical college (by UGMEB of NMC).
- For Practical /Clinical examinations, there shall be at least four examiners for every learner, out of whom not less than 50% must be external examiners. Of the four examiners, the senior-most internal examiner shall act as the Chairman and coordinator of the whole examination programme so that uniformity in the matter of assessment of candidates is maintained.
- A University having more than one college shall have separate sets of examiners for each college, with internal examiners from the concerned college. External examiner may be from outside the college/ university/ state/ union territory.
- There shall be a Chairman of the Board of paper-setters who shall be an internal examiner and shall moderate the questions.
- All eligible examiners with requisite qualifications and experience can be appointed internal examiners by rotation in their subjects.
- All theory paper assessment should be done as central assessment program (CAP) of concerned university.
- Internal examiners shall be appointed from the same institution for unitary examination in the same institution. For pooled examinations at one centre, the approved internal examiners from same university may be appointed.
- The Examiners for General Surgery and allied subjects as well as for General Medicine and allied subjects, shall be from General Surgery and General Medicine respectively.
- There shall be no grace marks to be considered for passing in an examination.

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AETCOM Competencies for First MBBS

Subject	Competency Number	Competency
Anatomy	Module 1.5	The cadaver as our first teacher Demonstrate respect and follow the correct procedure when handling cadavers and other biologic tissue
	Module 1.1	Identify, discuss Physician's role and responsibility to society and the community that he serves
Physiology	Module 1.2, Module 1.3	Demonstrate empathy in patient encounters
	Module 1.4	Demonstrate ability to communicate to patients in a patient, respectful, non-threatening, non-judgmental and empathetic manner
Biochemistry	Module 1.1,	Enumerate and Describe the role of a Physician in health care system
	Module 1.1	Describe and discuss the commitment to lifelong learning as an important part of Physician growth



AETCOM Competencies for Second MBBS

Subject	Competency Number	Competency
Pathology	2.6	Identify, discuss and define medico-legal, socio-cultural and ethical issues as they pertain to refusal of care including do not resuscitate and withdrawal of life support.
	2.4 A	Demonstrate ability to work in a team of peers and superiors.
	2.4 B	Demonstrate respect in relationship with patients, fellow team members, superiors and other health care workers.
	2.7	Identify, discuss and defend, medico-legal, socio-cultural and ethical issues as they pertain to consent for surgical procedures.
Microbiology	Module 2.2 A	Describe and discuss the role of non-maleficence as a guiding principle in patient care
	Module 2.2 B	Describe and discuss the role of autonomy and shared responsibility as a guiding principle in patient care
	Module 2.2 C	Describe and discuss the role of beneficence of a guiding principle inpatient care
	Module 2.2 D	Describe and discuss the role of a Physician in health care system
	Module 2.2 E	Describe and discuss the role of justice as a guiding principle in patient Care
	Module 2.3	Describe and discuss the role of justice as a guiding principle in patient care
	Module 2.5	Identify, discuss and defend medico-legal, socio-cultural and ethical issues as it pertains to patient autonomy, patient rights and shared responsibility in health care
Pharmacology	Module 2.1	Demonstrate ability to communicate to patients in a patient, respectful, non-threatening, non-judgmental and empathetic manner.
	Module 2.8	Demonstrate empathy in patient encounters.



AETCOM Competencies for Third Year (Part I)

Subject	Competency Number	Competency
Ophthalmology	3.1	Demonstrate ability to communicate to patients in a patient, respectful, nonthreatening, non-judgmental and empathetic manner
	3.2	Demonstrate an understanding of the implications and the appropriate procedure and response to be followed in the event of medical error
(Oto-Rhino-Laryngology(ENT)	3.3 A	Demonstrate ability to communicate to patients in a patient, respectful, nonthreatening, non-judgmental and empathetic manner
	3.3 B	Identify, discuss and defend, medico-legal, socio-cultural and ethical issues as they pertain to consent for surgical procedures
Forensic Medicine & Toxicology	3.3 C	Administer informed consent and appropriately address patient queries to a patient undergoing a surgical procedure in a simulated environment
	3.4	Identify, discuss and defend medico-legal, socio-cultural and ethical issues as it pertains to confidentiality in patient care
Community Medicine	3.5 A	Identify, discuss and defend medico-legal, socio-cultural, professional and ethical issues as it pertains to the physician - patient relationship (including fiduciary duty)
	3.5 B	Identify and discuss physician's role and responsibility to society and the community that she/ he serves



AETCOM Competencies for Third Year (Part II)

Subject	Competency Number	Competency
Medicine and Allied Subjects	4.1 A	The student should be able to: Demonstrate ability to communicate to patients in a patient, respectful, nonthreatening, non-judgmental and empathetic manner
	4.1 B	The student should be able to: Communicate diagnostic and therapeutic options to patient and family in a simulated environment
	4.3	The student should be able to: Identify and discuss medico-legal, socio-economic and ethical issues as it pertains to organ donation
Surgery and Allied Subjects	4.4 A	The student should be able to: Demonstrate empathy in patient encounters
	4.4 B	The student should be able to: Communicate care options to patient and family with a terminal illness in a simulated environment
	4.5	The student should be able to: Identify and discuss and defend medico-legal, socio-cultural, professional and ethical issues in physician - industry relationships
	4.6	The student should be able to: Identify conflicts of interest in patient care and professional relationships and describe the correct response to these conflicts
Obstetrics and Gynecology	4.2	The student should be able to: Identify, discuss and defend medico-legal, socioeconomic and ethical issues as it pertains to abortion / Medical Termination of Pregnancy and reproductive rights
	4.7	The student should be able to: Identify conflicts of interest in patient care and professional relationships and describe the correct response to these conflicts
	4.8 A	The student should be able to: Identify conflicts of interest in patient care and professional relationships and describe the correct response to these conflicts.
	4.8 B	The student should be able to: Demonstrate empathy to patient and family with a terminal illness in a simulated environment.
Pediatrics	4.9 A	The student should be able to: Identify, discuss and defend medico-legal, socio-cultural, professional and ethical issues pertaining to medical negligence
	4.9 B	The student should be able to: Identify, discuss and defend medico-legal, socio-cultural, professional and ethical issues pertaining to malpractice



Table1: Time distribution of MBBS Programme & Examination Schedule

Academic Calendar for CBME 2023-24 Batch

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2023								1	2	3	4	5
2024	6	7	8	9	10	11	12-1 st Prof exam, result	13-2 nd MBBS	14	15	16	17
2025	18	19	20	21	22	23	24-2 nd Prof exam, result	25-Final 1 st	26	27	28	29
2026	30	31	32	33	34	35	36-Final 1 st exam, result	37-Final 2 nd	38	39	40	41
2027	42	43	44	45	46	47	48	49	50	51	52	53 Final Exam/NExT
2028	54 NExT	1-CRMI	2	3	4	5-2 nd NExT	6	7	8	9	10	11
2029	12 NExT											

Legends:

AETCOM: Attitude, Ethics and Communication skills

FAP: Family Adoption Programme (village outreach)

SDL: Self Directed Learning

SGL: Small Group Learning (tutorials/ Seminars/ Integrated Learning)

Note : NExT shall be as per NExT Regulations



Table2: Distribution of subjects in each Professional Phase

Phase & year of MBBS training	Subjects & Teaching Elements	Duration (months)	University Examination
First Professional MBBS	(i) Foundation course -1 week, remaining spread over 6 months at the discretion of college. (ii) Anatomy, Physiology & Biochemistry, Introduction to Community Medicine, Family adoption programme (FAP) through village outreach (iii) Medicine, Humanities. (iv) Early Clinical Exposure. (v) Attitude, Ethics, and communication Module (AETCOM)	12 months	1 st professional
Second Professional MBBS	(i) Pathology, Microbiology, Pharmacology (ii) Introduction to clinical subjects (iii) Clinical postings, Family visits for FAP (iv) AETCOM	12 months	2 nd professional
Third Professional part 1, MBBS, including Electives 1 month	(i) Community Medicine, Forensic Medicine and Toxicology, Medicine & allied, Surgery & allied, Pediatrics and Obstetrics & Gynecology. (ii) Family visits for FAP (iii) Clinical postings (iv) AETCOM (v) Electives- 1 month, 2 blocks, 15 days each	12 months	Final professional-Part I
Third Professional part 2, MBBS	(i) General Medicine, Dermatology, Psychiatry, Respiratory medicine, Pediatrics, General Surgery, Orthopedics, Otorhinolaryngology, Ophthalmology, Radiodiagnosis, Anesthesiology, Obstetrics & Gynecology (ii) Clinical postings (iii) AETCOM	18 months	Final Professional-Part II



Table 3: Foundation Course
(one week + spread over 6 months at the discretion of college)

Subjects/Contents	Teaching hours
Orientation	30
Skills Module	34
Field visit to Community Health Center	08
Introduction to Professional Development & AETCOM module	40
Sports, Yoga and extra-curricular activities	16
Enhancement of language/computer skills	32
Total	160



Table No. 4 - Distribution of Subject Wise Teaching Hours for 1st MBBS

Subject	Lectures	SGL	SDL	Total
Foundation Course	-	-	-	39
Anatomy	210	400	10	620
Physiology*	130	300	10	440
Biochemistry	78	144	10	232
Early Clinical Exposure**	27	-	-	27
Community Medicine	20	20	-	40
FAP	-	-	27	27
(AETCOM)***	-	26	-	26
Sports and extra-curricular activities	-	-	-	10
Formative Assessment and Term examinations	-	-	-	60
Total	464	918	30	1521 #

- Including Molecular Biology

** Early Clinical exposure hours to be divided equally in all three subjects.

***AETCOM module shall be a longitudinal programme.

Includes hours for Foundation course also



Table No. 5 - Distribution of Subject Wise Teaching Hours for II MBBS

Subjects	Lectures	SGL	Clinical Postings*	SDL	Total
Pathology	80	165	-	10	255
Pharmacology	80	165	-	10	255
Microbiology	70	135	-	10	215
Community Medicine	15	0	0	10	25
FAP	0	0	30	-	30
Forensic Medicine and Toxicology	12	22	-	08	42
Clinical Subjects	59	-	540	-	599
AETCOM	-	29	-	8	37
Sports and extra-curricular activities	-	-	-	20	35
Pandemic module				28	28
Final total	316	516	585	104	1521

Note : Clinical postings shall be for 3 hours per day, Monday to Friday.

There will be 15 hours per week for all clinical postings.



Table No. 6 - Distribution of Subject Wise Teaching Hours for Final MBBS part 1

Subject	Lectures	SGL	SDL	Total
Electives	0	156	0	156
Gen. Med.	30	50	10	90
Gen Surgery	30	50	10	90
Obs. & Gyn	30	50	10	90
Pediatrics	25	30	10	65
Ortho+ PMR	15	20	10	45
For. Med.& Tox.	40	70	20	130
Community Med	55	70	20	145
FAP (Visits +log book submission)	-	21	10	31
Otorhinolaryngology (ENT)	15	20	10	45
Ophthalmology	15	20	10	45
Clinical posting	-	-	540	540
AETCOM	0	19	12	31
Pandemic module	18	0	0	18
Total	273	546	672	1521



Table 7: Distribution of Subject wise Teaching Hours for
Third professional part-2/ Final MBBS

Subjects	Lectures	SGL	SDL	Total
General Medicine	80	140	40	260
General Surgery	80	140	40	260
Obstetrics and Gynecology	80	140	40	260
Pediatrics	30	60	30	120
Orthopedics + Phys. Med. Rehab	25	35	25	85
AETCOM	30	0	22	52
Dermatology	15	10	15	40
Psychiatry	15	15	15	45
Respiratory Medicine	15	15	15	45
Otorhinolaryngology (ENT)	15	25	15	55
Ophthalmology	15	25	15	55
Radiodiagnosis +RT	8	15	15	38
Anesthesiology	8	15	15	38
Pandemic module	28	-	-	28
TOTAL	444	610	302	1356

Extra time for SDL/preparation for NExt



Table No. 8: Clinical Posting Schedules in weeks

Subjects	Period of training in weeks			Total Weeks
	II MBBS	III MBBS Part I	III MBBS Part II	
Electives	0	4	0	4
General Medicine	7	4	10	21
General Surgery	7	4	10	21
Obstetrics & Gynaecology	7	4	10	21
Pediatrics	4	4	5	13
Community Medicine	4	4	0	8
Orthopaedics, PMR, Trauma	2	2	4	8
Otorhinolaryngology	0	3	4	7
Ophthalmology	0	3	4	7
Respiratory Medicine	0	0	3	3
Psychiatry	0	2	4	6
Radio-diagnosis	0	0	2	2
Dermatology	2	2	2	6
Dentistry	1	0	0	1
Anaesthesiology	0	0	3	3
Emergency Medicine	2	0	1	3
Total	36	36	62	134



Table 9: Learner- Doctor programme (Clinical Clerkship)

Year of Curriculum	Focus of Learner-Doctor programme
Year 1	Introduction to hospital environment, early clinical exposure, understanding perspectives of illness, Family Adoption Program(FAP)
Year 2	History taking, physical examination, assessment of change in clinical status, communication and patient education, FAP
Year 3	All of the above and choice of investigations, basic procedures and continuity of care
Year 4	All of the above (except FAP) and decision making, management and outcomes



Table 10 : Marks distribution for various subjects for University Annual Examinations

Phase of Course	Theory	Practicals	Passing criteria
1st MBBS			
Anatomy- 2 papers	Paper 1- 100	100	Mandatory to get 50% marks separately in theory and in practicals.
	Paper 2 -100		
Physiology- 2 papers	Paper 1- 100	100	
	Paper 2 -100		
Biochemistry- 1 paper	Paper 1- 100	50	
2nd MBBS			
Pathology - 2 papers	Paper 1- 100	100	For theory, papers 1 and 2 for the same subject, aggregate of 50% in both papers.
	Paper 2 -100		
Microbiology- 1 paper	Paper 1- 100	100	
	Paper 2- 100		
Pharmacology- 2 papers	Paper 1 -100	100	
	Paper 2- 100		
Final MBBS part 1			
Forensic Med. Tox.- 1 paper	Paper 1 - 100	50	
Community Med- 2 papers	Paper 1 -100	100	
	Paper 2- 100		

For NEXT, as per NEXT regulations.



**GUIDELINES FOR MANPOWER REQUIREMENT FOR RESEARCH FACILITIES
IN A MEDICAL COLLEGE**

Research labs can be under following categories:

1. Molecular lab
2. Stem cell research lab
3. Cytogenetics
4. HLA and tissue typing research lab

Applied Clinical research for organ perfusion, cancer research, in vitro fertilization, etc. can be under any of the above research facilities.

MAN POWER:

(1) Lab Director : **1(One) Post**

Minimum Qualifications required :

- (i) MD Path/MD Microbiology/MD Transfusion Medicine/MD Biochemistry.
- (ii) Faculty with PhD (Medical subject will be preferred)

Lab work : 10 years experience

Lab research related publications : Minimum 10 in last 10 years

(2) Lab Supervisor : **1(One) Post (per research facility)**

Minimum Qualifications required:

- (i) MD Path/ MD Microbiology/MD Transfusion Medicine/MD Biochemistry
- (ii) Faculty with Ph.D. (Medical subject) will be preferred, or M.Sc. in life sciences with PhD from Medical college.

Lab work : 7 years experience

Lab research related publications : Minimum 5 in last 5 years

(3) Senior Scientific Research Officer : **1(One) Post or more (per research facility)**



- Minimum Qualifications required :
 (i) PhD with MD Path/MD Microbiology/MD Transfusion Medicine/MD Biochemistry/PhD in medical college or MSc in life sciences with PhD from medical college
- Lab work : 4 years experience
- Lab research related publications : Minimum 3 in last 3 years
- (4) **Junior Research Officer** : 1(One) or more (per research facility)
- Minimum Qualifications required :
 (i) MD Path/ MD Microbiology/ MD Transfusion Medicine/MD Biochemistry or Diploma in Clinical Pathology/ M.Sc. in Life Sciences, Ph.D. scholar/ Postdoc fellow
 (ii) Diploma holder in any branch may pursue PhD if experience / research inclinations proved for minimum of 1 year. They can be enrolled for integrated Master's PhD course.
- Lab work : 1 year experience
- Lab research related publications : preferably 1 in last 2 years
- (5) **Laboratory Technicians** : **Minimum 2(two) Posts**
- Minimum Qualifications required :
 (i) B.Sc./M.Sc. in Life Sciences including Biotechnology,
 (ii) DMLT
- (6) **Data entry operator/ Clerk** : Minimum 1(One)



- Minimum Qualifications required :
Experience :
- (7) **Store keeper** : Minimum 1(One)
- Minimum Qualifications required :
Experience :
- (8) **Biostatistician** : Minimum 1(One)
- Minimum Qualifications required :
Experience :
- (9) **Lab attendant** :
(10) **Peon/ Multi-task worker** :
(11) **Clinical Monitors** :
- Any MBBS or above with research inclination
- (12) **Social worker/ MSW with applied research inclinations**



**NATIONAL MEDICAL COMMISSION (UNDERGRADUATE MEDICAL
EDUCATION) GUIDELINES, 2023**

CURRICULUM FOR FAMILY ADOPTION PROGRAMME

FAMILY ADOPTION PROGRAM:

This is being introduced with the aim of village outreach program for MBBS students. Every college may arrange one diagnostic medical camp in the village wherein identification of:

- a) anaemia, malnutrition in children, hypertension, diabetes mellitus, ischemic heart diseases, kidney diseases, any other local problems may be addressed.
- b) If required, patients shall be admitted in the hospital for acute illness under care of student, charges may be waived off or provide concession or govt. schemes.
- c) For chronic illness, students shall be involved.
- d) Subsidized treatment charges may be provided under govt. schemes or welfare schemes.
- e) Medical student may be allocated about 5 families and introduced in the first visit.
- f) Camps may be arranged by Dean and Community Medicine/ P.S.M. department with active involvement of Associate/ Asst. Professors, social worker and supporting staff. Local population may be involved with village leaders.
- g) Visit by students be made to the visit as mentioned in table below. Annual follow up diagnostic camp can be continued by the PSM department.

TARGETS TO BE ACHIEVED BY STUDENTS:

First Professional Year:

- a) Learning communication skills and inspire confidence amongst families
- b) Understand the dynamics of rural set-up of that region
- c) Screening programs and education about ongoing government sponsored health related programs
- d) Learn to analyse the data collected from their families
- e) Identify diseases/ ill-health/ malnutrition of allotted families and try to improve the standards

Second Professional Year

- a) Inspire active participation of community through families allotted
- b) Continue active involvement to become the first doctor /reference point of the family by continued active interaction
- c) Start compiling the outcome targets achieved

Third Professional Year

Analysis of their involvement and impact on existing socio-politico-economic dynamics in addition to improvement in health conditions



-Final visit to have last round of active interaction with families

-prepare a report to be submitted to department addressing:

- 1) Improvement in general health
- 2) Immunization
- 3) Sanitation,
- 4) De-addiction
- 5) Whether healthy lifestyles like reading good books, sports/ yoga activities have been inculcated in the house-holds.
- 6) Improvement in anaemia, tuberculosis control
- 7) Sanitation awareness
- 8) Any other issues
- 9) Role of the student in supporting family during illness/ medical emergency
- 10) Social responsibility in the form of environment protection programme in form of plantation drive (medicinal plants/trees), cleanliness and sanitation drives with the initiative of the medical student

Curriculum for Family Adoption Programme

Professional Year	Competency The student should be able to	Objectives	Suggested Teaching Learning methods	Suggested Assessment methods	Teaching Hours
1 st Professional	Collect demographic profile of allotted families, take history and conduct clinical examination of all family members	By the end of this visit, students should be able to compile the basic demographic profile of allocated family members	Family survey, Community clinics	Community case presentation, OSPE, logbook, journal of visit	6 hrs
	Organize health check-up and coordinate treatment of adopted family under overall guidance of mentor	By the end of this visit, students should be able to report the basic health profile and treatment history of allocated family members	Community clinics, Multispecialty camps	Community case presentation, OSPE, logbook, journal of visit	9 hrs
	Maintain communication & follow up of remedial measures	By the end of this visit, students should be able to provide details of communication maintained with family members for follow-up of treatment and	Reporting of follow up visits, PRA techniques (transact walk, group discussion) Community	Community case presentation, OSPE, logbook based of competency, journal of visit	6 hrs



	Take part in environment protection and sustenance activities.	suggested remedial measures By the end of this visit, students should be able to report the activities undertaken for environment protection and sustenance like study of environment of families, tree plantation/ herbal plantation activities conducted in the village	clinics, Participation in and Process documentation of activities (NSS activities) along with reporting of photographic evidences	logbook certification based of competency, journal of visit	6hrs (Total 27 hrs, 9 visits)
2 nd Professional	- Take history and conduct clinical examination of all family members - Organize health check-up and coordinate treatment of adopted family under overall guidance of mentor	By the end of this visit, students should be able to compile the updated medical history of family members and report their vitals and anthropometry By the end of this visit, students should be able to report the details of clinical examination like Hb %, blood group, urine routine and blood sugar along with treatment history of allocated family members	Family survey, Community clinics Community clinics, Multispecialty camps	Community case presentation, OSPE, logbook, journal of visit Community case presentation, OSPE, logbook, journal of visit	6 hrs 9 hrs

	Maintain communication & follow up of remedial measures	By the end of this visit, students should be able to provide details of communication maintained with family members for follow-up of treatment, and suggested remedial measures along with details of vaccination drive	Reporting of follow up visits, PRA techniques (transact walk, group discussion) Community clinics,	Community case presentation, OSPE, logbook based certification of competency, journal of visit	9 hrs
	Take part in environment protection and sustenance activities.	By the end of this visit, students should be able to report the activities undertaken for environment protection and sustenance like study of environment of families, tree plantation/ herbal plantation activities conducted in the village	Participation in and Process documentation of activities (NSS activities) along with reporting of photographic evidences	logbook based certification of competency, journal of visit	6 hrs
					(Total 30 hrs, 10 visits)
3 rd Professional	Take history and conduct clinical examination of all family members	By the end of this visit, students should be able to update the medical history of family members and their vitals and anthropometry	Family survey, Community clinics	Community case presentation, OSPE, logbook, journal of visit	3hrs
	Organize health check-up and coordinate treatment of adopted family under overall guidance of mentor	By the end of this visit, students should be able to report the details of clinical examination like Hb %, blood group, urine	Community clinics, Multispecialty camps	Community case presentation, OSPE, logbook, journal of visit	3hrs

		routine and blood sugar along with treatment history of allocated family members			
	Maintain communication & follow up of remedial measures	By the end of this visit, students should be able to provide details of communication maintained with family members for follow-up of treatment, and suggested remedial measures along with details of vaccination drive	Reporting of follow up visits, PRA techniques (transact walk, group discussion) Community clinics,	Community case presentation, OSPE, logbook based certification of competency, journal of visit	3hrs
	- Take part in environment protection and sustenance activities. - Council the family members of allotted families and analyze the health trajectory of adopted family under overall guidance of mentor	By the end of this visit, students should be able to report the activities undertaken for environment protection and sustenance like study of environment of families, tree plantation/ herbal plantation activities conducted in the village, By the end of this visit, students should be able to analyze and report the health trajectory of adopted family along with remedial measures adopted at individual, family and community level	Participation in and Process documentation of activities (NSS activities) along with reporting of photographic evidences, Small group discussion (report of the health trajectory of adopted family)	logbook based certification of competency, journal of visit	3hrs
					(total 21 hrs, 7 visits)

LOG BOOK FOR FAMILY ADOPTION

COLLEGE NAME :

UNIVERSITY :

ADDRESS DETAILS :

NAME OF THE STUDENT :

ROLL NO. :

VILLAGE NAME :

TEHSIL/ DISTRICT :

STATE/ UNION TERRITORY :

NAME OF THE MENTOR :

MENTOR STATUS :

Asst. Prof/ S.R. And Details
(If changed, details of subsequent
mentors)

NAME OF ASHA WORKER :

ADDRESS OF ASHA WORKER :

EXPERIENCE :

(SINCE HOW MANY YEARS IS HE/ SHE EMPLOYED)

(SEPARATE PAGE FOR EACH FAMILY BE MAINTAINED)

- Family name and address
 - Approximate size of living space of house-hold
 - Malaria/ flu/ etc pertinent to the region
- 1) If there is any illness or medical emergency required by the house-hold, the student should take initiative in being the primary contact for the family.
 - 2) The student in turn should consult his/her mentor for further management of the patient.
 - 3) The hospital to which the college is attached must provide treatment facilities to the patient.
 - 4) Government schemes may be utilized for optimal management.
 - 5) Follow-up records must be maintained by the student. These must be periodically evaluated by mentors with the help of senior residents.
 - 6) The entire data sheet may be prepared by every student and submitted by the end of 6th semester for evaluation.
 - 7) Progress notes must include every demographic point and history recorded.



Appendix "H - 1"

Guidelines regarding admission of students with "Specified Disabilities" under the Rights of Persons with Disabilities Act, 2016 with respect to admission in MBBS Course.

- Note : 1. The "Certificate of Disability" shall be issued in accordance with the Rights of Persons with Disabilities Rules, 2017 notified in the Gazette of India by the Ministry of Social Justice and Empowerment [Department of Empowerment of Persons with Disabilities (*Divyangjan*)] on 15th June 2017.
2. The extent of "specified disability" in a person shall be assessed in accordance with the "Guidelines for the purpose of assessing the extent of specified disability in a person included under the Rights of Persons with Disabilities Act, 2016 (49 of 2016)" notified in the Gazette of India by the Ministry of Social Justice and Empowerment [Department of Empowerment of Persons with Disabilities (*Divyangjan*)] on 4th January 2018.
3. The minimum degree of disability should be 40% (Benchmark Disability) in order to be eligible for availing reservation for persons with specified disability.
4. The term 'Persons with Disabilities' (PwD) is to be used instead of the term 'Physically Handicapped' (PH).

S. No.	Disability Type	Type of Disabilities	Specified Disability	Disability Range		
				Eligible for Medical Course, Not Eligible for PwD Quota	Eligible for Medical Course, Eligible for PwD Quota	Not Eligible for Medical Course
I.	Physical Disability	A. Locomotor Disability, including Specified Disabilities(a to f)	a. Leprosy cured person*	Less than 40% disability	40-80% disability Persons with more than 80% disability may also be allowed on case to case basis and their functional competency will be determined with the aid of assistive devices, if it is being used, to see if it is brought below 80% and whether they possess sufficient motor ability as required to pursue and complete the course satisfactorily.	More than 80%
			b. Cerebral Palsy**			
			c. Dwarfism			
			d. Muscular Dystrophy			
			e. Acid attack victims			
			f. Others*** such as Amputation, Poliomyelitis, etc.			
		* Attention should be paid to loss of sensations in fingers and hands, amputation, as well as involvement of eyes and corresponding recommendations be looked at ** Attention should be paid to impairment of vision, hearing, cognitive function etc and corresponding recommendations be looked at *** (i) Both hands intact, with intact sensations, sufficient strength and range of motion are essential to be considered eligible for medical course. (ii) Movement of the upper limb with respect to all the joints (shoulder, elbow, forearm, wrist and all fingers) to be considered – full power, intact, in the dominant upper limb is necessary. (iii) For non-dominant upper limb, power of 4/5 or above is recommended				
		B. Visual Impairment (*)	a. Blindness	Less than 40% disability	-	Equal to or More than 40% Disability
			b. Low vision			
		C. Hearing impairment@	a. Deaf	Less than 40% Disability	-	Equal to or more than 40% Disability
			b. Hard of hearing			
		(*) Persons with Visual impairment / visual disability of equal to or more than 40% may be made eligible to pursue MBBS Course and may be given reservation, subject to the condition that the visual disability is brought to a level of less than the benchmark of 40% with advanced low vision aids such as telescopes / magnifier etc. @Person with hearing disability of more than 40% may be made eligible to pursue MBBS Course and may be given reservation subject to condition that the hearing disability is brought to a level of less than the bench mark of 40% with the aid of assistive devices/cochlear implants (CI). In addition to this, the individual should have speech discrimination score of more than 60%				

		Disability Range				
Type of Disabilities		Specified Disability	Eligible for Medical Course, Not Eligible for PwD Quota	Eligible for Medical Course, Eligible for PwD Quota	Not Eligible for Medical Course	
D. Speech & language disability\$		Organic/ neurologi calcauses	Less than 40% Disability	-	Equal to or more than 40% Disability	
		\$ Persons with Speech Intelligibility Affected (SIA) shall be eligible to pursue MBBS Courses, provided Speech Intelligibility Affected (SIA) score shall not exceed 3 (three), which is 40% or below. Persons with Aphasia shall be eligible to pursue MBBS Courses, provided Aphasia Quotient (AQ) is 40% or below.				
2.	Intellectual disability	a. Specific learning disabilities (Perceptual disabilities, Dyslexia, Dyscalculia, Dyspraxia & Developmental aphasia)#	# currently there is no Quantification scale available to assess the severity of SpLD, therefore the cut-off of 40% is arbitrary and more evidence is needed.	Less than 40% Disability	Equal to or more than 40% disability and equal to or less than 80%. But selection will be based on the learning competency evaluated with the help of the remediation/assisted technology/aids/infrastructural changes by the Expert Panel.	More than 80% or severe nature of significant cognitive/ intellectual disability.
		b. Autism spectrum disorders	Absence or Mild Disability, Asperger syndrome (disability of upto 60% as per ISAA) where the individual is fit for MBBS course by an expert panel.	Currently not recommended due to lack of objective method to establish presence and extent of mental illness. However, the benefit of reservation/quota may be considered in future after developing better methods of disability assessment.	More than 60% disability or presence of cognitive/intellectual disability and/or if the person is unfit for pursuing MBBS course by an expert panel.	
3.	Mental behavior	Mental illness	Absence or mild Disability less than 40% (under IDEAS)	Currently not recommended due to lack of objective method to establish presence and extent of mental illness. However, the benefit of reservation/quota may be considered in future after developing better methods of disability assessment. According to the Notification dated 09.12.2020 by the Department of Empowerment of Persons with Disabilities (Divyangjan), Ministry of Social Justice, a diagnosis of SLD using NIMHANS SLD Battery should be equated to more than 40% disability. Any person with SLD and more than 40% disability should be allowed to complete on par with other PwDs under the reservation quota for PwDs.	Equal to or more than 40% disability or if the person is unfit to perform his/her duties. Standards may be drafted for the definition of "fitness to practice medicine" as are used by several institutions of countries other than India.	

4	Disability Type	Type of Disabilities	Specified Disability	Disability Range		
				Eligible for Medical Course, Not Eligible for PwD Quota	Eligible for Medical Course, Eligible for PwD Quota	Not Eligible for Medical Course
	Disability caused due to	a. Chronic Neurological Conditions	i. Multiple Sclerosis	Less than 40% Disability	40-80% disability	More than 80%
			ii. Parkinsonism			
		b. Blood Disorders	i. Haemophilia	Less than 40% Disability	40-80% disability	More than 80%
			ii. Thalassemia			
			iii. Sickle cell disease			
5	Multiple disabilities including deaf		More than one of the abovespecified disabilities	Must consider all above while deciding in individual cases recommendations with respect to presence any of the above, namely. Visual, Hearing, Speech & Language disability, Intellectual Disability, and Mental Illness as a component of Multiple Disability Combining Formula as notified by the related Gazette Notification issued by the Govt. of India $a + \frac{b(90-a)}{90}$ (where a= higher value of disability % and b=lower value of disability % as calculated for different disabilities) is recommended for computing the disability arising when more than one disabling condition is present in a given individual. This formula may be used in cases with multiple disabilities, and recommendations regarding admission and/or reservation made as per the specific disabilities present in a given individual		

(NMC Format)
1st year MBBS Student admission in College for the Year...

Name of the Medical College:

1	S.NO.	
2	State	
3	College name	
4	Merit no.	
5	Name of Students	
6	Gender	
7	Physically Handicapped	
8	Date of Birth	
9	Category	
10	Sub-category	
11	Marks obtained/ maximum marks in 10+2 (PCB)	
12	PCB percentage	
13	Marks obtained /maximum marks in 10+2 (English)	
14	English Percentage	
15	Marks obtained/Maximum marks in NEET Entrance Exam	
16	NEET Entrance Exam Percentage	
17	Date of Admission	
18	NEET Roll No.	
19	Fees Charged	

[Handwritten signature]

DEPARTMENT OF Anatomy/Physiology/Biochemistry

Faculty : MBBS Year/Phase-

S.No.	Roll No.	Name of Student	Formative Assessment Theory			Continuous Internal assessment Theory						Cumulative percent of Theory & Practical		
			1st PCT Theory	2nd PCT Theory	Prelims Theory (Paper I & II)	Home Assignment	Seminar	Continuous Class Test (LMS)	Self Directed Learning		Attendance Theory	Total	Percentage Theory (Minimum cut off 40%)	Theory+ Practical = 500+500= 1000 (Minimum cut off 50%)
1			100	100	200	15	15	30	15	15	10	500	%	
2														
3														

Note: Minimum 40% separately for theory and practical and 50% cumulative in IA for eligibility in Summative examination

S/d
Professor & Head
Department of _____
Medical College,
Univ.
State/ U.T.

Faculty : MBBS Year/Phase-

Department of Anatomy/Physiology/Biochemistry

Date : dd/mm/yyyy

			Formative Assessment			Continuous Internal Assessment (Practical)								
S.No.	Roll No.	Name of Student	1st PCT Practical/First Ward Leaving Examination	2nd PCT Practical /Second Ward Leaving Examination	Prelims Practical	Log book (150)					Journal (Record book/Portf	Attendance (Practical)	Total	Percentage Practical (Minimum cut off 40%)
						Certifiable skill based competencies (Through OSPE/OSCE/Spock/Exercise/Other		FAP competencies	AETCOM competencies	SVL Lab activity				
			100	100	100	70	10	30	40	40	10	500	%	
1														
2														
3														

S/d
Professor & Head
Department of _____
**Medical College
University, State/ U.T.

Faculty : MBBS Year/Phase-

Department OF Patho/Pharmac/Microbiology

			Formative Assessment_Theory			Continuous Internal assessment_Theory						Cumulative percent of Theory & Practical		
			1st PCT Theory	2nd PCT Theory	Prelims Theory (Paper I & II)	Home Assignment [†]	Seminar	Continuous Class Test (LMS)	Museum study	Library assignments	Attendance Theory	Total	Percentage Theory (Minimum cut off 40%)	Theory+ Practical = 500+500= 1000 (Minimum cut off 50%)
S.No.	Roll No.	Name of Student							Self Directed Learning					Note: Minimum 40% separately for theory and practical and 50% cumulative in IA for eligibility in Summative examination
1			100	100	200	15	15	30	15	15	10	500	%	
2														
3														

Note: Minimum 40% separately for theory and practical and 50% cumulative in it for eligibility in Summative examination

S/d
Professor & Head
Department of _____
College,
Univ.,
State/U.T.

Faculty : MBBS Year/Phase-

Department of Patho/Pharmac/Microbiology

Date : dd/mm/yyyy

S.No.	Roll No.	Name of Student	Formative Assessment			Continuous Internal Assessment (Practical)							
			1st PCT Practical/First Ward Leaving Examination	2nd PCT Practical /Second Ward leaving Examination	Prelims Practical	Log book (150)			FAP	Journal (Record book)	Attendance (Practical)	Total	Percentage Practical (Minimum cut off 40%)
						Certifiable skill based competencies (Through OSPE/OSCE/Spock/Exericise/Other)	AETCOM competencies	SVL Lab activity					
			100	100	100	60	30	40	20	40	10	500	%
1													
2													
3													

S/d
Prof. , HOD,
College,
Univ,
State/ U.T.

DEPARTMENT OF FORENSIC MEDICINE AND TOXICOLOGY

S.No.	Roll No.	Name of Student	Formative Assessment Theory					Continuous Internal assessment Theory					Cumulative percent of Theory & Practical		
			1st PCT Theory	2nd PCT Theory	Prelims Theory (Paper I & II)	Home Assignment	Seminar	Continuous Class Test (LMS)	Museum study	Library assignments	Attendance Theory	Total	Percentage Theory (Minimum cut off 40%)	Theory+ Practical = 375+500= 875 (Minimum cut off 50%)	
1			100	100	100	10	10	25	10	10	10	375	%		
2															
3															

S/d
Professor & Head
Department of _____
* Medical College
University
State/
U.T.

DEPARTMENT OF FORENSIC MEDICINE AND TOXICOLOGY

Faculty : MBBS Year/Phase-

Date : dd/mm/yyyy

S.No.	Roll No.	Name of Student	Formative Assessment			Continuous Internal Assessment (Practical)							
			1st PCT Practical/First Ward Leaving Examination	2nd PCT Practical /Second Ward Leaving Examination	Prelims Practical	Log book (150)			Journal (Record book/ Portfolio)	Attendance (Practical)	Total	Percentage Practical (Minimum cut off 40%)	
			100	100	100	Certifiable skill based competencies (Through OSPE/OSCE/Spot/Exercise/Other)	AETCOM competencies	SVL Lab activity					
			100	100	100	70	40	40	40	10	500	%	
1													
2													
3													

S/d
Professor & Head
Department of _____
* Medical College
University
State/ U.T.

DEPARTMENT OF COMMUNITY MEDICINE

S.No.	Roll No.	Name of Student	Formative Assessment_Theory			Continuous Internal assessment_Theory							Cumulative percent of Theory & Practical		
			1st PCT Theory	2nd PCT Theory	Prelims Theory (Paper I & II)	Home Assignment	Seminar	Continuous Class Test (LMS)	Self Directed Learning		Attendance Theory	Total	Percentage Theory (Minimum cut off 40%)	Theory+ Practical = 500+500= 1000 (Minimum cut off 50%)	
			100	100	200	15	15	30	15	15	10	500	%	Note: Minimum 40% separately for theory and practical and 50% cumulative in Ia for eligibility in Summative examination	
1															
2															
3															

Note: Minimum 40% separately for theory and practical and 50% cumulative in Ia for eligibility in Summative examination

S/d
Professor & Head
Department of _____
* Medical College
University
State/
U.T.



Faculty : MBBS Year/Phase-

Department of Community Medicine

Date : dd/mm/yyyy

S.No.	Roll No.	Name of Student	Formative Assessment			Continuous Internal Assessment (Practical)							Percentage Practical (Minimum cut off 40%)
			1st PCT Practical/First Ward Leaving Examination	2nd PCT Practical /Second Ward Leaving Examination	Prelims Practical	Log book (150)			Journal (Record book/ Portfolio)	Attendance (Practical)	Total		
			100	100	100	Certifiable skill based competencies (Through OSPE/OSCE/Spots/Exercise/Other)	Family Adoption Programme competencies in Comm. Med	AETCOM competencies				500	%
1													
2													
3													

S/d
Professor & Head
Department of _____
* Medical College
University
State/ U.T.

DEPARTMENT OF Medicine, Surgery, OBGY

S.No.	Roll No.	Name of Student	Formative Assessment_Theory			Continuous Internal assessment_Theory					Cumulative percent of Theory & Practical			
			1st PCT Theory	2nd PCT Theory	Prelims Theory (Paper I & II)	Home Assignmen t	Seminar	Continuous Class Test (LMS)	Museum study	Library assignments	Attendance Theory	Total	Percentage Theory (Minimum cut off 40%)	Theory+ Practical = 500+650= 1150 (Minimum cut off 50%)
			100	100	200	15	15	30	15	15	10	500	%	
1														
2														
3														

S/d
Professor & Head
Department of _____
* Medical College, University
State/ U.T.



DEPARTMENT OF Medicine, Surgery, OBGY

S.No.	Roll No.	Name of Student	Formative Assessment			Continuous Internal Assessment (Practical)						
			1st PCT Practical/First Ward Leaving Examination	2nd PCT Practical /Second Ward Leaving Examination	Prelims Practical	Log book (200)			Journal (Record book/Portfolio)	Attendance (Practical)	Total	Percentage Practical (Minimum cut off 40%)
						Certifiable skill based competencies (Through OSPE/OSCE/Spots/Exercise/Other)	AETCOM competencies	SVL Lab activity				
1			100	100	200	100	50	50	40	10	650	%
2												
3												

S/d
Professor & Head
Department of _____
*Medical College
University
State/ U.T.

DEPARTMENT OF PAEDIATRICS, OPHTHALMOLOGY, OTORHINOLARYNGOLOGY (ENT)

Faculty : MBBS Year/Phase-

DEPARTMENT OF Paediatrics/ Ophthalm/ ENT

S.No.	Roll No.	Name of Student	Formative Assessment_Theory			Continuous Internal assessment_Theory						Cumulative percent of Theory & Practical		
			1st PCT Theory	2nd PCT Theory	Prelims Theory (Paper I & II)	Home Assignment	Seminar	Continuous Class Test (LMS)	Museum study Self Directed Learning	Library assignments	Attendance Theory	Total	Percentage Theory (Minimum cut off %)	Theory+ Practical = 375+500= 875 (Minimum cut off 50%)
			100	100	100	10	10	25	10	10	10	375		
1														
2														
3														

[Signature]

Department of Paediatrics/ Ophthalm/ ENT

S.No.	Roll No.	Name of Student	Formative Assessment			Continuous Internal Assessment (Practical)						
			1st PCT Practical/First Ward Leaving Examination	2nd PCT Practical /Second Ward Leaving Examination	Prelims Practical	Log book (200)			Journal (Record book/Portf olio)	Attendance (Practical)	Total	Percentage Practical (Minimum cut off 40%)
			100	100	200	Certifiable skill based competencies (Through OSPE/OSCE/Spots/Exercise/Other)	AETCOM competencies	SVL Lab activity	40	10	650	%
1							50	50				
2												
3												

[Signature]

S/d
Professor & Head
Department of _____
*Medical College
University
State/ U.T.

दूरभाष/Phone : 25367033, 25367035, 25367036
फेक्स/Fax : 0091-11-25367024
ई-मेल/E-mail : ug@nmc.org.in,

पॉकेट-14, सेक्टर-8, द्वारका,
फेस-1, नईदिल्ली-77
Pocket- 14, Sector- 8, Dwarka,
Phase – 1, New Delhi-77

राष्ट्रीय आयुर्विज्ञान आयोग
National Medical Commission
(Undergraduate Medical Education Board)

No. U.14021/8/2023-UGMEB

Dated, the 01st August, 2023

**Subject: - Competency Based Medical Education Curriculum (CBME)
Guidelines- National Medical Commission.**

Under Graduate Medical Education Board invited comments on draft Competency Based Medical Education Guidelines vide Public Notice of even no. dated 23/06/2023.

2. After consideration of comments received, in exercise of powers conferred by the National Medical Commission Act, 2019 and particularly by sections 10, 24, 25, and 57 of the said Act, Under Graduate Medical Education Board publishes the Competency Based Medical Education Guidelines.

3. Guidelines shall be effective from the date of its publication i.e.; 01/08/2023.


01/08/2023
(Shambhu Sharan Kumar)
Director, UGMEB

CBME CURRICULUM

1. Preamble

The new Graduate Medical Education Regulations attempts to stand on the shoulder of the contributions and the efforts of resource persons, teachers and students (past and present). It intends to take the learner to provide health care to the evolving needs of the nation and the world.

About 25 years have passed since the existing Regulations on Graduate Medical Education, 1997 were notified, necessitating a relook at all aspects of the various components in the existing regulations and adapt them to the changing demography, socio-economic context, perceptions, values, advancements in medical education and expectations of stakeholders. Emerging health care issues particularly in the context of emerging diseases, impact of advances in science and technology and shorter distances on diseases and their management also need consideration. The strong and forward-looking fundamentals enshrined in the Regulations on Graduate Medical Education, 1997 has made this job easier. A comparison between the 1997 Regulations and proposed Graduate Medical Education Regulations, 2019 will reveal that the 2019 Regulations have evolved from several key principles enshrined in the 1997 Regulations.

The thrust in the new regulations is continuation and evolution of thought in medical education making it more learner-centric, patient-centric, gender- sensitive, outcome -oriented and environment appropriate. The result is an outcome driven curriculum which conforms to global trends. Emphasis is made on alignment and integration of subjects both horizontally and vertically while respecting the strengths and necessity of subject-based instruction and assessment. This has necessitated a deviation from using “broad competencies”; instead, the reports have written end of phase subject (sub) competencies. These “sub-competencies” can be mapped to the global competencies in the Graduate Medical Education Regulations.

The importance of ethical values, responsiveness to the needs of the patient and acquisition of communication skills is underscored by providing dedicated curriculum time in the form of a longitudinal program based on Attitude, Ethics and Communication (AETCOM) competencies. Great emphasis has been placed on collaborative and inter-disciplinary

teamwork, professionalism, altruism and respect in professional relationships with due sensitivity to differences in thought, social and economic position and gender.

2. Objectives of the Indian Graduate Medical Training Programme

The undergraduate medical education program is designed with a goal to create an “Indian Medical Graduate” (IMG) possessing requisite knowledge, skills, attitudes, values and responsiveness, so that she or he may function appropriately and effectively as a physician of first contact of the community while being globally relevant. To achieve this, the following national and institutional goals for the learner of the Indian Medical Graduate training program are hereby prescribed.

3. National Goals

At the end of undergraduate program, the Indian Medical Graduate should be able to:

- a. Recognize “health for all” as a national goal and health right of all citizens and by undergoing training for medical profession fulfill his social obligations towards realization of this goal.
- b. Learn key aspects of National policies on health and devote himself to its practical implementation.
- c. Achieve competence in practice of holistic medicine, encompassing promotive, preventive, curative and rehabilitative aspects of common diseases.
- d. Develop scientific temper, acquire educational experience for proficiency in profession and promote healthy living.
- e. Become exemplary citizen by observance of medical ethics and fulfilling social and professional obligations, so as to respond to national aspirations.

4. Institutional Goals

In consonance with the national goals, each medical institution should evolve institutional goals to define the kind of trained manpower (or professionals) they intend to produce. The Indian Medical Graduates coming out of a medical institute should:

- a. Be competent in diagnosis and management of common health problems of the individual and the community, commensurate with his/her position as a member of the health team at the primary, secondary or tertiary levels, using his/her clinical skills based on history, physical examination and relevant investigations.
- b. Be competent to practice preventive, promotive, curative, palliative and rehabilitative medicine in respect to the commonly encountered health problems.
- c. Appreciate rationale for different therapeutic modalities; be familiar with the administration of the "essential drugs" and their common side effects.
- d. Appreciate the socio-psychological, cultural, economic and environmental factors affecting health and develop humane attitude towards the patients in discharging one's professional responsibilities.
- e. Possess the attitude for continued self-learning and to seek further expertise or to pursue research in any chosen area of medicine, action research and documentation skills.
- f. Be familiar with the basic factors which are essential for the implementation of the National Health Programs including practical aspects of the following:
 - i) Family Welfare and Maternal and Child Health (MCH);
 - ii) Sanitation and water supply;
 - iii) Prevention and control of communicable and non-communicable diseases;
 - iv) Immunization;
 - v) Health Education and advocacy;
 - vi) Indian Public Health Standards (IPHS) at various level of service delivery;
 - vii) Bio-medical waste disposal
 - viii) Organizational and or institutional arrangements.

- g. Acquire basic management skills in the area of human resources, materials and resource management related to health care delivery, general and hospital management, principal inventory skills and counseling.
- h. Be able to identify community health problems and learn to work to resolve these by designing, instituting corrective steps and evaluating outcome of such measures with maximum community participation.
- i. Be able to work as a leading partner in health care teams and acquire proficiency in communication skills.
- j. Be competent to work in a variety of health care settings.
- k. Have personal characteristics and attitudes required for professional life including personal integrity, sense of responsibility and dependability and ability to relate to or show concern for other individuals.

5. Goals for the Learner

In order to fulfill these goals, the Indian Medical Graduate must be able to function in the following roles appropriately and effectively:-

- a. Clinician who understands and provides preventive, promotive, curative, palliative and holistic care with compassion.
- b. Leader and member of the health care team and system with capabilities to collect, analyze, synthesize and communicate health data appropriately.
- c. Communicator with patients, families, colleagues and community.
- d. Lifelong learner committed to continuous improvement of skills and knowledge.
- e. Professional, who is committed to excellence, is ethical, responsive and accountable to patients, community and profession.
- f. Critical thinker who demonstrates problem solving skills in professional practice

- g. Researcher who generates and interprets evidence

6. Competency Based Training Programme of the Indian Medical Graduate

Competency based learning would include designing and implementing medical education curriculum that focuses on the desired and observable ability in real life situations. In order to effectively fulfill the roles, the Indian Medical Graduate would have obtained the following set of competencies at the time of graduation:

Clinician, who understands and provides preventive, promotive, curative, palliative and holistic care with compassion

- Demonstrate knowledge of normal human structure, function and development from a molecular, cellular, biologic, clinical, behavioral and social perspective.
- Demonstrate knowledge of abnormal human structure, function and development from a molecular, cellular, biological, clinical, behavioral and social perspective.
- Demonstrate knowledge of medico-legal, societal, ethical and humanitarian principles that influence healthcare.
- Demonstrate knowledge of national and regional health care policies including the National Health Mission that incorporates National Rural Health Mission (NRHM) and National Urban Health Mission (NUHM), frameworks, economics and systems that influence health promotion, health care delivery, disease prevention, effectiveness, responsiveness, quality and patient safety.
- Demonstrate ability to elicit and record from the patient, and other relevant sources including relatives and caregivers, a history that is complete and relevant to disease identification, disease prevention and health promotion.
- Demonstrate ability to elicit and record from the patient, and other relevant sources including relatives and caregivers, a history that is contextual to gender, age, vulnerability, social and economic status, patient preferences, beliefs and values.
- Demonstrate ability to perform a physical examination that is complete and relevant to disease identification, disease prevention and health promotion.
- Demonstrate ability to perform a physical examination that is contextual to gender,

social and economic status, patient preferences and values.

- Demonstrate effective clinical problem solving, judgment and ability to interpret and integrate available data in order to address patient problems, generate differential diagnoses and develop individualized management plans that include preventive, promotive and therapeutic goals.
- Maintain accurate, clear and appropriate record of the patient in conformation with legal and administrative frameworks.
- Demonstrate ability to choose the appropriate diagnostic tests and interpret these tests based on scientific validity, cost effectiveness and clinical context.
- Demonstrate ability to prescribe and safely administer appropriate therapies including nutritional interventions, pharmacotherapy and interventions based on the principles of rational drug therapy, scientific validity, evidence and cost that conform to established national and regional health programmers and policies for the following:
 - Disease prevention,
 - Health promotion and cure,
 - Pain and distress alleviation, and
 - Rehabilitation and palliation.
- Demonstrate ability to provide a continuum of care at the primary (including home care) and/or secondary level that addresses chronicity, mental and physical disability.
- Demonstrate ability to appropriately identify and refer patients who may require specialized or advanced tertiary care.
- Demonstrate familiarity with basic, clinical and translational research as it applies to the care of the patient.

Leader and member of the health care team and system

- Work effectively and appropriately with colleagues in an inter-professional health care team respecting diversity of roles, responsibilities and competencies of other professionals.
- Recognize and function effectively, responsibly and appropriately as a health care team leader in primary and secondary health care settings.

- Educate and motivate other members of the team and work in a collaborative and collegial fashion that will help maximize the health care delivery potential of the team.
- Access and utilize components of the health care system and health delivery in a manner that is appropriate, cost effective, fair and in compliance with the national health care priorities and policies, as well as be able to collect, analyze and utilize health data.
- Participate appropriately and effectively in measures that will advance quality of health care and patient safety within the health care system.
- Recognize and advocate health promotion, disease prevention and health care quality improvement through prevention and early recognition: in a) life style diseases and b) cancer, in collaboration with other members of the health care team.

Communicator with patients, families, colleagues and community

- Demonstrate ability to communicate adequately, sensitively, effectively and respectfully with patients in a language that the patient understands and in a manner that will improve patient satisfaction and health care outcomes.
- Demonstrate ability to establish professional relationships with patients and families that are positive, understanding, humane, ethical, empathetic, and trustworthy.
- Demonstrate ability to communicate with patients in a manner respectful of patient's preferences, values, prior experience, beliefs, confidentiality and privacy.
- Demonstrate ability to communicate with patients, colleagues and families in a manner that encourages participation and shared decision- making.

7. Lifelong learner committed to continuous improvement of skills and knowledge

- Demonstrate ability to perform an objective self-assessment of knowledge and skills, continue learning, refine existing skills and acquire new skills.
- Demonstrate ability to apply newly gained knowledge or skills to the care of the patient.
- Demonstrate ability to introspect and utilize experiences, to enhance personal and professional growth and learning.

- Demonstrate ability to search (including through electronic means), and critically re-evaluate the medical literature and apply the information in the care of the patient.
- Be able to identify and select an appropriate career pathway that is professionally rewarding and personally fulfilling.

Professional who is committed to excellence, is ethical, responsive and accountable to patients, community and the profession

- Practice selflessness, integrity, responsibility, accountability and respect.
- Respect and maintain professional boundaries between patients, colleagues and society.
- Demonstrate ability to recognize and manage ethical and professional conflicts.
- Abide by prescribed ethical and legal codes of conduct and practice.
- Demonstrate a commitment to the growth of the medical profession as a whole.

A. CURRICULUM

➤ 1st Professional Year:

1. ANATOMY

a. Competencies:

The undergraduate must demonstrate:

- Understanding of the gross and microscopic structure and development of human body,
- Comprehension of the normal regulation and integration of the functions of the organs and systems on basis of the structure and genetic pattern,
- Understanding of the clinical correlation of the organs and structures involved and interpret the anatomical basis of the disease presentations.

b. Broad subject specific objectives

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

- Comprehend the normal disposition, clinically relevant interrelationships, functional and cross -sectional Anatomy of the various organs and structures of the body.
- Identify the microscopic structure and correlate elementary ultra structure of various organs and tissues 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 analyze the integrative and regulative functions of the organs and systems. He should be able to locate the site of gross lesions according to the deficits encountered
- Demonstrate knowledge of the basic principles and sequential development of the organs and systems; recognize the critical stages of development and the effects of common teratogens, genetic mutations and environmental hazards. He should be able to explain the developmental basis of the major variations and abnormalities.

c. Skills:

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

- Identify and locate all the structures of the body and mark the topography of the Living Anatomy.
- Understand clinical basis of some common clinical procedures i.e. intramuscular and intravenous injection, lumbar puncture and kidney biopsy etc.
- Identify the organs and tissues under the microscope.
- Understand the principles of karyotyping and identify the gross congenital anomalies.
- Understand principles of newer imaging techniques and interpretation of CT scan, sonogram, MRI & Angiography.

d. Integration:

The teaching should be aligned and integrated horizontally and vertically in organ systems with clinical correlation that will provide a context for the learner to

understand the relationship between structure and function and interpret the anatomical basis of various clinical conditions and procedures.

2. PHYSIOLOGY

a. Competencies: The undergraduates must demonstrate:

- Understanding of the normal functioning of the organs and organ systems of the body,
- Comprehension of the normal structure and organization of the organs and systems on basis of the functions,
- Understanding of age-related physiological changes in the organ functions that reflect normal growth and development,
- Understand the physiological basis of diseases.

b. Broad subject specific objectives

Knowledge

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

- Describe the normal functions of all the systems, the regulatory mechanisms and interactions of the various systems for well-coordinated total body functions.
- Understanding the relative contribution of each organ system in the maintenance of the milieu interior (homeostasis)
- Explain the physiological aspects of the normal growth and development.
- Analyze the physiological responses and adaptation to environmental stress. Comprehend the physiological principles underlying pathogenesis and treatment of disease.
- Correlate knowledge of physiology of human reproductive system in relation to National Family welfare program.

c. Skills

At the end of the course the student shall be able to:

- Conduct experiments designed for study of physiological phenomenon.
- Interpret experimental /investigative data.
- Distinguish between normal and abnormal data derived as a result of clinical examination and tests, which he has performed and observed in the laboratory.
- Recognize and get familiar with newer computerized and advanced instruments like medspiror, semen quality analyzer, EMG and TMT

d. Integration: The teaching should be aligned and integrated horizontally and vertically in organ systems in order to provide a context in which normal function can be correlated both with structure and with the biological basis, its clinical features, diagnosis and therapy.

3. BIOCHEMISTRY

a. Competencies:

The learner must demonstrate an understanding of:

- Biochemical and molecular processes involved in health and disease,
- Importance of nutrition in health and disease,
- Biochemical basis and rationale of clinical laboratory tests, and demonstrate ability to interpret these in the clinical context.

b. Broad subject specific objectives:

Knowledge:

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

- Enlist and describe the cell organelles with their molecular and functional organization.
- Delineate structure, function and interrelationships of various biomolecules and consequences of deviation from the normal.
- Understand basic enzymology and emphasize on its clinical applications wherein regulation of enzymatic activity is disturbed.
- Describe digestion and assimilation of nutrients and consequences of malnutrition.
- Describe and integrate metabolic pathways of various biomolecules with their regulatory mechanisms.
- Explain the biochemical basis of inherited disorders with their associated sequelae.
- Describe mechanisms involved in maintenance of water, electrolyte and acid base balance and consequences of their imbalances.
- Outline the molecular mechanisms of gene expression and regulation, basic principles of biotechnology and their applications in medicine.

c. Skills

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

- Make use of conventional techniques / instruments to perform biochemical analysis relevant to clinical screening and diagnosis;
- Analyse and interpret investigative data;
- Demonstrate the skills of solving scientific and clinical problems and decision making.

d. Integration:

The teaching/learning programme should be integrated horizontally and vertically, as much as possible, to enable learners to make clinical correlations and to acquire an understanding of the cellular and molecular basis of health and disease.

2nd Professional Year:

4. PATHOLOGY

a. Competencies:

The undergraduate must demonstrate:

- Comprehension of the causes, evolution and mechanisms of diseases,
- Knowledge of alterations in gross and cellular morphology of organs in disease states,
- Ability to correlate the natural history, structural and functional changes with the clinical manifestations of diseases, their diagnosis and therapy,

b. Broad subject specific objectives

Knowledge:

At the end of one and half years, the student shall be able to:-

- Describe the structure and ultra structure of a sick cell, causes and mechanisms of cell Injury, cell death and repair.
- Correlate structural and functional alterations in the sick cell.
- Explain the path physiological processes, which govern the maintenance of homeostasis, mechanisms of their disturbance and the morphological and clinical manifestation associated with it.
- Describe the mechanisms and patterns of tissue response to injury so as to appreciate the path physiology of disease processes and their application to clinical science.
- Correlate the gross and microscopic alterations of different organ systems in common disease to the extent needed for understanding disease processes and their clinical significance.
- Develop an understanding of steps in neoplastic changes in the body and their effects in order to appreciate need for early diagnosis and further management of neoplasia.
- Understand mechanisms of common hematological disorders and develop a logical approach in their diagnosis and management.
- Develop understanding of the blood banking, blood donors & transfusion of blood & blood products, (components).
- Understand pathophysiology of infectious diseases in relation with tissue changes.

- Describe the various immunological reactions in understanding the disease process & tissue transplant.
- Develop an understanding for genetic disorders.
- Understand the vital organ function test of Kidney, liver & thyroid.

c. Skills

At the end of one and half years, the student shall be able to:

- Describe the rationale and principles of routine technical procedures of the diagnostic laboratory tests & perform it.
- Interpret routine diagnostic laboratory tests and correlate with clinical, hematological and morphological changes.
- Perform the simple bed-side tests on blood, urine and other biological fluid samples:
- Draw a rational scheme of investigations aimed at diagnosing and managing the cases of common disorders.
- Able to understand the microscopic and macroscopic features of common diseases.
- Develop different type of skills such as observation skills, communication skill and presentation skill.
- Understand biochemical/physiological disturbances that occur as a result of disease in collaboration with all concerned departments.

d. Integration: The teaching should be aligned and integrated horizontally and vertically in organ systems recognizing deviations from normal structure and function and clinically correlated so as to provide an overall understanding of the etiology, mechanisms, laboratory diagnosis, and management of diseases.

5. MICROBIOLOGY

a. Competencies:

The undergraduate learner demonstrates:

- Understanding of role of microbial agents in health and disease,
- Understanding of the immunological mechanisms in health and disease,
- Ability to correlate the natural history, mechanisms and clinical manifestations of infectious diseases as they relate to the properties of microbial agents,
- Knowledge of the principles and application of infection control measures,
- An understanding of the basis of choice of laboratory diagnostic tests and their interpretation, antimicrobial therapy, control and prevention of infectious diseases.
- Knowledge of outbreak investigation and its control.

b. Broad subject specific objectives

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

- Explain how the different microorganisms can cause human infection.
- Understand commercial, opportunistic and pathogenic organisms and describe host parasite relationship.
- Describe the characteristics (morphology, cultural characteristics, resistance, virulence factors, incubation period, mode of transmission etc.) of different microorganisms.
- Explain the various defense mechanisms of the host against the microorganisms which can cause human infection.
- Describe the laboratory diagnosis of microorganisms causing human infections and disease.
- Describe the prophylaxis for the particular infecting microorganisms

c. Skills

At the end of the course the student shall be able to

- Plan the laboratory investigations for the diagnosis of infectious diseases.
- Perform laboratory procedures to arrive at the etiological diagnosis of infectious diseases caused by bacteria, fungi, viruses and parasites including the drug sensitivity profile.
- Perform and interpret immunological and serological tests.
- Operate routine and sophisticated instruments in the laboratory.
- Develop microteaching skills and Pedagogy
- Successfully implement the chosen research methodology

d. Integration: The teaching should be aligned and integrated horizontally and vertically in organ systems with emphasis on host-microbe-environment interactions and their alterations in disease and clinical correlations so as to provide an overall understanding of the etiological agents, their laboratory diagnosis and prevention.

6. PHARMACOLOGY

a. Competencies: The undergraduate must demonstrate:

- Knowledge about essential and commonly used drugs and an understanding of the pharmacologic basis of therapeutics,
- Ability to select and prescribe medicines based on clinical condition and the pharmacologic properties, efficacy, safety, suitability and cost of medicines for common clinical conditions of national importance,
- Knowledge of pharmacovigilance, essential medicine concept and sources of drug information and industry-doctor relationship,
- Ability to counsel patients regarding appropriate use of prescribed drug and drug delivery systems.

b. Broad subject specific objectives

(A) Knowledge:

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

- Describe the Pharmacokinetics and Pharmacodynamics of essential and commonly used drugs.
- Enlist the indications, contraindications, interactions and adverse reactions of commonly used drugs.
- Tailor the use of appropriate drugs in disease with consideration of its cost, efficacy and safety for-
 - a. Individual needs and
 - b. Mass therapy, under National Health Programs.
- Integrate the list of drugs of addiction and recommend the management of drug addiction.
- Explain pharmacological basis of prescribing drugs in special medical situations such as pregnancy, lactation, infancy, old age, renal damage, hepatic damage and immuno-compromised patients.
- Explain the concept of rational drug therapy in clinical pharmacology.
- State the principles underlying the concept of 'Essential Drugs'.
- Evaluate the ethics and modalities involved in the development and introduction of new drugs.

c. Skills

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

- Prescribe drugs for common ailments.
- Identify adverse reactions and drug interactions of commonly used drugs.
- Interpret the data obtained from the experiments designed for the study of effect of drugs in various experimental and clinical studies.
- Analyze the information regarding common pharmaceutical preparations and critically evaluate drug formulations.
- Appraise the Principles of Clinical Pharmacy and Dispense the Medications giving proper instructions.

d. Integration: Practical knowledge of use of drugs in Clinical Practice will be acquired through Integrated Teaching vertically with phase 1 subjects and horizontally with other phase 2 subjects.

3rd Professional year

7. FORENSIC MEDICINE AND TOXICOLOGY

a. Competencies: The learner must demonstrate:

- Understanding of medico-legal responsibilities of physicians in primary and secondary care settings,
- Understanding of the rational approach to the investigation of crime, based on scientific and legal principles,
- Ability to manage medical and legal issues in cases of poisoning /overdose,
- Understanding the medico-legal framework of medical practice and medical negligence,
- Understanding of codes of conduct and medical ethics,
- Understanding concept of deceased donor, brain death, and Human Organ Transplantation Act.

b. Broad subject specific objectives:

Knowledge: At the end of the course, the student shall be able to

- Identify the basic Medico-legal aspects of hospital and general practice.
- Define the Medico-legal responsibilities of a general physician while rendering community service either in a rural primary health centre or an urban health centre.

- Appreciate the physician's responsibilities in criminal matters and respect for the codes of Medical ethics.
- Diagnose, manage and identify legal aspect of common acute and chronic poisonings.
- Describe the Medico-legal aspects and findings of post-mortem examination in cases of death due to common unnatural conditions and poisonings.
- Detect occupational and environmental poisoning, prevention and epidemiology of common poisoning and their legal aspects particularly pertaining to Workmen's Compensation Act.
- Describe the general principles of analytical toxicology.

c. Skills

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

- Make observations and draw logical inferences in order to initiate enquiries in criminal matters and Medico-legal problems and be able to -
- Carry on proper Medico-legal examination and documentation/Reporting of Injury and Age.
- Conduct examination for sexual offences and intoxication.
- Preserve relevant ancillary materials for medico-legal examination.
- Identify important post-mortem findings in common unnatural deaths.
- Diagnose and treat common emergencies in poisoning and chronic toxicity.
- Make observations and interpret findings at post-mortem examination.
- Observe the principles of medical ethics in the practice of his profession.

d. Integration:

The teaching should be aligned and integrated horizontally and vertically recognizing the importance of medico-legal, ethical and toxicological issues as they relate to the practice of medicine.

8. COMMUNITY MEDICINE

a. Competencies: The undergraduate must demonstrate:

- Understanding of the concept of health and disease,
- Understanding of demography, population dynamics and disease burden in National and global context,
- Comprehension of principles of health economics and hospital management,
- Understanding of interventions to promote health and prevent diseases as envisioned in National and State Health Programmes.
- Understanding of physical, social, psychological, economic and environmental determinants of health and disease,
- Ability to recognize and manage common health problems including physical, emotional and social aspects at individual family and community level in the context of National Health Programmes,
- Ability to Implement and monitor National Health Programmes in the primary care setting,
- General knowledge about Organ and Tissue donation,
- Knowledge of maternal and child wellness as they apply to national health care priorities and programmes,
- Ability to recognize, investigate, report, plan and manage community health problems including malnutrition and emergencies.

b. Broad subject specific objectives:

Knowledge: At the end of the course the student shall be able

- Explain the principles of sociology including demographic population dynamics.
- Identify social factors related to health, disease and disability in the context of urban and rural societies.
- Appreciate the impact of urbanization on health and disease.
- Observe and interpret the dynamic of community behaviors.

- Describe the elements of normal psychology and social psychology.
- Observe the principles of practice of medicine in hospital and community settings.
- Describe the health care delivery systems including rehabilitation of the disabled in the country.
- Describe the National Health Programmes with particular emphasis on maternal and child health programmes, family welfare planning and population control.
- Describe the epidemiological methods and techniques.
- Outline the demographic pattern of the country and appreciate the roles of the individuals, family, community and socio-cultural milieu in health and disease.
- Describe the health information systems.
- Acquire, understand, integrate, apply and manage information in context to health care problems and health care delivery system in various communities, health care settings and hospitals.
- Describe the principles and components of primary health care, National Rural Health Mission and the national health policies to achieve the goal of "Health for all" with regards to identify the environmental, bio-waste and occupational hazards and their control.
- Describe the importance of water and sanitation in human health.
- Describe the principles of health economics, health administration, health education in relation to community.
- Critically analyze the problem (s) and apply his/her knowledge to solve the problem in holistic manner.
- Describe and apply principles of prevention, promotion and maintenance of health.

c. Skills: At the end of the course, the student shall be able to –

- Use the principles and practice of medicine in hospital and community settings and familiarization with elementary practices.
- Use the Art of communication with patients including history taking and medico social work.

- Use epidemiology as a scientific tool to make rational decisions relevant to community and individual patient intervention.
- Organize health care services for vulnerable and disadvantaged groups.
- Organize health care services in case of calamities.
- Collect, analyze, interpret and present simple community and hospital base data.
- Diagnose and manage common health problems (including communicable and non-communicable diseases) and emergencies at the individual, family and community levels keeping in mind the existing health care resources and in the context of the prevailing socio-culture beliefs.
- Diagnose and manage common nutritional problems at the individual and community level.
- Plan, implement and evaluate a health education Programme with skill to use simple audio-visual aids.
- Interact with other members of the health care team and participate in the organization of health care services, health advocacy and implementation of national health programmes.
- Perform Administrative functions at health centers
- Observe the principles of medical ethics in the practice of his profession.

d. Integration:

Department shall adopt an integrated approach towards other clinical disciplines, public health services, NGOs, environmental sciences, social sciences, management, hospital administration, research, etc. to impart training to enable the graduate to work at all levels of health care. The teaching should be aligned and integrated horizontally and vertically in order to allow the learner to understand the impact of environment, society and national health priorities as they relate to the promotion of health and prevention and cure of disease.

9. OTO-RHINOLARYNGOLOGY (ENT)

a. Competencies: The learner must demonstrate:

- Knowledge of the common Otorhinolaryngological (ENT) emergencies and problems,
- Ability to recognize, diagnose and manage common ENT emergencies and problems in primary care setting,
- Ability to perform simple ENT procedures as applicable in a primary care setting,
- Ability to recognize hearing impairment and refer to the appropriate hearing impairment rehabilitation programme.

b. Broad subject specific objectives:

- **Knowledge:** At the end of the course, the student shall be able to :
- Describe the basic pathophysiology of common Ear, Nose & Throat (ENT) diseases & emergencies.
- Adopt the rational use of commonly used drugs keeping in mind their adverse reactions.
- Suggest common investigative procedures & their interpretation.

c. Skills: At the end of the course the student shall be able to

- Examination & Diagnose common ENT problems including pre-malignant & Malignant disorders of the Head & Neck.
- Manage ENT problems at first level of care & be able to refer whenever necessary.
- Assist / carry out minor ENT procedures like ear syringing, ear dressing, nasal packing.
- Assist in certain procedures such as tracheotomy, endoscopy & removal of foreign bodies.

d. Integration:

The teaching should be aligned and integrated horizontally and vertically in

order to allow the learner to understand the structural basis of ENT problems, their management and correlation with function, rehabilitation and quality of life. The undergraduate training ENT will provide an integrated approach towards other disciplines especially, neurosciences, ophthalmology & general surgery.

10. OPHTHALMOLOGY

a. Competencies: The student must demonstrate:

- Knowledge of common eye problems in the community
- Recognize, diagnose and manage common eye problems and identify indications for referral,
- Ability to recognize visual impairment and blindness in the community and implement national programmes as applicable in the primary care setting.

b. Broad subject specific objectives

Knowledge: At the end of the course, student shall have the knowledge of

- Common problems affecting the eye.
- Principles of management of major ophthalmic emergencies.
- Main systemic disease affecting the eye.
- Effects of local and systemic diseases on patient's vision and the necessary action required minimizing the sequelae of such diseases.
- Adverse drug reaction with special reference to ophthalmic manifestations.
- Magnitude of blindness in India and its main causes.
- National programme for control of blindness and its implementation at various levels.
- Eye care education for prevention of eye problems.
- Role of primary health center in organization of eye camps.

- Organization of primary health care and the functioning of the ophthalmic assistant.
- Integration of the national programme for control of blindness with the other national health programmes.
- Eye bank organization.

c. Skills

- Elicit a history pertinent to general health and ocular status.
- Assist in diagnostic procedures such as visual acuity testing, examination of eye, Schiottz tonometry, Staining of Corneal pathology, confrontation, perimetry, Subjective refraction including correction of Presbyopia and aphakia, direct ophthalmoscopy and conjunctival smear examination and Cover test.
- Diagnose and treat common problems affecting the eye.
- Interpret ophthalmic signs in relation to common systemic disorders.
- Assist/observe therapeutic procedures such as Subconjunctival injection, corneal conjunctival foreign body removal, carbolic cautery for corneal ulcers, Nasolacrimal duct syringing and tarsorrhaphy
- Provide first aid in major ophthalmic emergencies.
- Assist to organize community surveys for visual check-up.
- Assist to organize primary eye care service through primary health centers.
- Use effective means of communication with the public and individual to motivate for surgery in cataract and for eye donation.
- Establish rapport with his seniors, colleagues and paramedical workers, so as to effectively function as a member of the eye care team.

d. Integration:

The teaching should be aligned and integrated horizontally and vertically in order to allow the student to understand the structural basis of ophthalmologic problems, their management and correlation with function,

rehabilitation and quality of life.

3rd PROFESSIONAL YEAR PART - II

Medicine Allied Subjects:

11. GENERAL MEDICINE

a. Competencies: The student must demonstrate ability to do the following in relation to common medical problems of the adult in the community:

- Demonstrate understanding of the pathophysiologic basis, epidemiological profile, signs and symptoms of disease and their investigation and management,
- Competently interview and examine an adult patient and make a clinical diagnosis,
- Appropriately order and interpret laboratory tests,
- Initiate appropriate cost-effective treatment based on an understanding of the rational drug prescriptions, medical interventions required and preventive measures,
- Follow up of patients with medical problems and refer whenever required,
- Communicate effectively, educate and counsel the patient and family,
- Manage common medical emergencies and refer when required,
- Independently perform common medical procedures safely and understand patient safety issues.

b. Broad subject specific objectives:

Knowledge: At the end of the course, the student shall be able to:

- Diagnose common clinical disorders with special reference to infectious diseases,

nutritional disorders, tropical and environmental diseases;

- Outline various modes of management including drug therapeutics especially dosage, side effects, toxicity, interactions, indications and contra-indications;
- Propose diagnostic and investigative procedures and ability to interpret them;
- Provide first level management of acute emergencies promptly and efficiently and decide the timing and level of referral, if required;
- Recognize geriatric disorders and their management.

c. Skills

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

- Develop clinical skills (history taking, clinical examination and other instruments of examination) to diagnose various common medical disorders and emergencies;
 - Refer a patient to secondary and/or tertiary level of health care after having instituted primary care;
 - Perform simple routine investigations like hemogram, stool, urine, sputum and biological fluid examinations;
 - Assist the common bedside investigative procedure like pleural tap, Lumbar puncture, bone marrow aspiration/biopsy and liver biopsy.
- d. Integration:** The teaching should be aligned and integrated horizontally and vertically in order to provide sound biologic basis and incorporating the principles of general medicine into a holistic and comprehensive approach to the care of the patient. With other relevant academic inputs which provide scientific basis of clinical medicine e.g. anatomy, physiology, biochemistry, microbiology, pathology and pharmacology.

12. PEDIATRICS

a. Competencies: The student must demonstrate:

- Ability to assess and promote optimal growth, development and nutrition of children and adolescents and identify deviations from normal,
- Ability to recognize and provide emergency and routine ambulatory and First

Level Referral Unit care for neonates, infants, children and adolescents and refer as may be appropriate,

- Ability to perform procedures as indicated for children of all ages in the primary care setting,
- Ability to recognize children with special needs and refer appropriately,
- Ability to promote health and prevent diseases in children,
- Ability to participate in National Programmes related to child health and in conformation with the Integrated Management of Neonatal and Childhood Illnesses (IMNCI) Strategy,
- Ability to communicate appropriately and effectively.

b. Broad subject specific objectives:

Knowledge:-At the end of the course, the students shall be able to:-

- Describe the normal Growth and Development during fetal life, Neonatal period, Childhood and Adolescence and the deviations thereof.
- Describe the common Pediatric disorders and emergencies in terms of Epidemiology, Etiopathogenesis, Clinical manifestations, Diagnosis and also describe the rational therapy and rehabilitation services.
- Workout age related requirements of calories, nutrients, fluids, dosages of drugs etc. in health and disease.
- Describe preventive strategies for common infectious disorders, Malnutrition, Genetic and Metabolic disorders, Poisonings, Accidents and Child abuse.
- Outline national programs related to child health including Immunization programs.

c. Skills

At the end of the course, the students shall be able to:-

- Take detailed Pediatric and Neonatal history and conduct an appropriate physical examination of children and neonates, make clinical diagnosis, conduct common

bedside investigative procedures, interpret common laboratory investigations, plan and institute therapy.

- Take anthropometric measurements, resuscitate newborn, prepare oral rehydration solution, perform tuberculin test, administer vaccines available under current National programs, perform venesection, start intravenous fluids and provide nasogastric feeding.
- Conduct diagnostic procedures such as lumbar puncture, liver and kidney biopsy, bone marrow aspiration, pleural and ascitic tap.
- Distinguish between normal Newborn babies and those requiring special care and institute early care to all newborn babies including care of preterm and low birth weight babies, provide correct guidance and counseling about breastfeeding and Complementary feeding.
- Provide ambulatory care to all not so sick children, identify indications for specialized/ inpatient care and ensure timely referral to those who require hospitalization.

d. Integration:

The teaching should be aligned and integrated horizontally and vertically in order to provide comprehensive care for neonates, infants, children and adolescents based on a sound knowledge of growth, development, disease and their clinical, social, emotional, psychological correlates in the context of national health priorities.

13. DERMATOLOGY

a. Competencies:

The undergraduate student must demonstrate:

- Understanding of the principles of diagnosis of diseases of the skin, hair, nail and mucosa,
- Ability to recognize, diagnose, order appropriate investigations and treat common diseases of the skin including leprosy in the primary care setting and refer as

appropriate,

- A syndromic approach to the recognition, diagnosis, prevention, counseling, testing and management of common sexually transmitted diseases including HIV based on national health priorities,
- Ability to recognize and treat emergencies including drug reactions and refer as appropriate.

b. Broad subject specific objectives:

Knowledge:

At the end of the course of Dermatology the student shall be able to :

- Demonstrate sound knowledge of common diseases, their clinical manifestations, including emergent situations and of investigative procedures to confirm their diagnosis
- Demonstrate comprehensive knowledge of various modes of therapy used in treatment of cutaneous, sexually transmitted diseases and leprosy
- Describe the mode of action of commonly used drugs, their doses, side effects/toxicity, indications and contra-indications and interactions
- Describe commonly used modes of management including the medical and surgical procedures available for the treatment of various diseases and to offer a comprehensive plan of management for a given disorder

c. Skills:

The student shall be able to

- Interview the patient, elicit relevant and correct information and describe the history in a chronological order:
- Conduct clinical examination, elicit and interpret physical findings and diagnose common disorders and emergencies.
- Demonstrate simple, routine investigative and laboratory procedures required for making the bed-side diagnosis, especially the examination of scrapings for fungus,

preparation of slit smears and staining for AFB for leprosy patients and for STD cases and take a skin biopsy for diagnostic purposes.

- Manage common diseases and recognizing the need for referral for specialized care, in case of inappropriateness of therapeutic response.

d. Integration:

The teaching should be aligned and integrated horizontally and vertically in order to emphasize the biologic basis of diseases of the skin, sexually transmitted diseases and leprosy

14. PSYCHIATRY

a. Competencies: The student must demonstrate:

Ability to promote mental health and mental hygiene,

- Knowledge of etiology (bio-psycho-social-environmental interactions), clinical features, diagnosis and management of common psychiatric disorders across all ages,
- Ability to recognize and manage common psychological and psychiatric disorders in a primary care setting, institute preliminary treatment in disorders difficult to manage, and refer appropriately,
- Ability to recognize alcohol/ substance abuse disorders and refer them to appropriate centers,
- Ability to assess risk for suicide and refer appropriately,
- Ability to recognize temperamental difficulties and personality disorders,
- Assess mental disability and rehabilitate appropriately,
- Understanding of National and State programmes that address mental health and welfare of patients and community.

b. Broad subject specific objectives:

Knowledge:

At the end of the course the student shall be able to:

- Understand the comprehensive nature & development of different aspects of normal human behavior like learning, memory, motivation, personality & intelligence
- Recognize differences between normal & abnormal behavior
- Classify psychiatric disorders
- Recognize clinical manifestations of the following common syndromes & plan their appropriate management of organic psychosis, functional psychosis, schizophrenia, affective disorders, neurotic disorders, personality disorders, psycho physiological disorders, drug & alcohol dependence, psychiatric disorders of childhood & adolescence
- Describe rational use of different mode of therapy in psychiatric disorders.

c. Skills:

The student shall be able to:

- Interview the patient & understand different methods of communications in patient-doctor relationship
- Elicit detailed psychiatric case history & conduct clinical examination for assessment of mental status
- Define, elicit & interpret psychopathological symptoms & signs
- Diagnose & manage common psychiatric disorders
- Identify & manage common psychological reactions & psychiatric disorders in medical & surgical patients in clinical practice & in community setting

d. Integration:

The teaching should be aligned and integrated horizontally and vertically in order to allow the student to understand bio-psycho-social-environmental interactions that lead to diseases/ disorders for preventive, promotive, curative, rehabilitative services and medico-legal implications in the care of patients both in family and

community.

16. GENERAL SURGERY

a. Competencies:

The student must demonstrate:

- Understanding of the structural and functional basis, principles of diagnosis and management of common surgical problems in adults and children
- Ability to choose, calculate and administer appropriately intravenous fluids, electrolytes, blood and blood products based on the clinical condition
- Ability to apply the principles of asepsis, sterilization, disinfection, rational use of prophylaxis, therapeutic utilities of antibiotics and universal precautions in surgical practice
- Knowledge of common malignancies in India and their prevention, early detection and therapy
- Ability to perform common diagnostic and surgical procedures at the primary care level
- Ability to recognize, resuscitate, stabilize and provide Basic & Advanced Life Support to patients following trauma
- General knowledge about organ retrieval from deceased donor and living donor
- Ability to administer informed consent and counsel patient prior to surgical procedures,
- Commitment to advancement of quality and patient safety in surgical practice.

b. Broad subject specific objectives.

Knowledge:

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

- Describe aetiology, pathophysiology, principles of diagnosis and management of common surgical problems including emergencies in adult and children.
- Define indications and methods for fluid and electrolytes replacement therapy including blood transfusion.
- Define asepsis, disinfection and sterilization and recommend judicious use of antibiotics.
- Describe common malignancies in the country and their management including prevention.
- Enumerate different types of anaesthetic agents, their indications, contraindications, mode of administration, and side effects.

c. Skills

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

- Diagnose common surgical conditions both acute and chronic, in adults and children.
- Plan various laboratory tests for surgical conditions and interpret the results.
- Identify and manage patients of hemorrhagic, septicaemia and other types of shock.
- Be able to maintain patent air-way and resuscitate.
- Monitor patient of head, chest, spinal and abdominal injuries, both in adults and children.
- Provide primary care for a patient of burns.
- Acquire principles of operative surgery including preoperative, operative and post operative care and monitoring.
- Treat open wound including preventive measures against tetanus and gas gangrene.

- Diagnose neonatal and pediatric surgical emergencies and provide sound primary care before referring the patient to secondary/tertiary centres.
- Identify congenital anomalies and refer them for appropriate management.

d. Integration: The teaching should be aligned and integrated horizontally and vertically in order to provide a sound biologic basis and a holistic approach to the care of the surgical patient.

- Apply knowledge of basic medical sciences and other relevant subjects to support understanding of various pathologies, facilitate examination of and intervention for the patients.
- To apply the principles of quality of health care, legal and ethical principles and regulations as recommended by Medical Council of India and WHO.

17. OBSTETRICS AND GYNAECOLOGY

a. Competencies:

The student must demonstrate ability to:

- Provide peri-conceptional counseling and antenatal care,
- Identify high-risk pregnancies and refer appropriately,
- Conduct normal deliveries, using safe delivery practices in the primary and secondary care settings,
- Prescribe drugs safely and appropriately in pregnancy and lactation,
- Diagnose complications of labor, institute primary care and refer in a timely manner,
- Perform early neonatal resuscitation,
- Provide postnatal care, including education in breast-feeding,
- Counsel and support couples in the correct choice of

contraception,

- Interpret test results of laboratory and radiological investigations as they apply to the care of the obstetric patient,
- Apply medico-legal principles as they apply to tubectomy, Medical Termination of Pregnancy (MTP), Pre-conception and Prenatal Diagnostic Techniques (PC PNDT Act) and other related Acts.
- Elicit a gynecologic history, perform appropriate physical and pelvic examinations and PAP smear in the primary care setting,
- Recognize, diagnose and manage common reproductive tract infections in the primary care setting,
- Recognize and diagnose common genital cancers and refer them appropriately.

b. Broad subject specific objectives

Knowledge

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

- Outline the anatomy, physiology and pathophysiology of the reproductive system and the common conditions affecting it.
- Diagnose normal pregnancy, labour, puerperium and manage the problems he is likely to encounter therein.
- List of leading causes of maternal and perinatal morbidity and mortality.
- Understand the principles of contraception and various techniques employed, methods of medical termination of pregnancy, sterilization and their complications.
- Identify the use, abuse and side effects of drugs in pregnancy, peri- menopausal and post menopausal periods.
- Describe the national programme of maternal and child health and family welfare and their implementation at various levels.

- Identify common gynecological diseases and describe principles of their management.
- State the indications, techniques and complications of surgeries like Caesarian section, laparotomy, abdominal and vaginal hysterectomy, Fothergill's operation and vacuum
- Aspiration for Medical Termination of pregnancy (MTP) and minor surgeries like EB, D and C, Cervical Biopsy and Cervical encircage.

c. Skills

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

- Take proper history and writing a good case sheet
- Writing a good discharge summary, proper referral letter
- Examination of patient and arrival at a diagnosis
- Planning for investigation and treatment
- Community orientation, participation in community health promoting and preventing programmes
- Examine a pregnant woman, recognize high- risk pregnancies and make appropriate referrals.
- Conduct a normal delivery, plot and interpret partogram
- recognize complications and decision of referral, provide postnatal care,
- Resuscitate the newborn and recognize the congenital anomalies.
- Advise a couple on the use of various available contraceptive devices (student should see at least 5 Cu-T insertions and 5 cases of female sterilization operations.)
- Perform pelvic examination, diagnose and manage common. gynecological problems including early detection of genital malignancies.
- Make a vaginal cytological smear, perform a post coital test and wet vaginal smear examination for Trichomonas vaginalis, Moniliasis and gram stain for gonorrhea, catheterization of urinary bladder
- Interpretation of data of investigations like biochemical, histopathological, radiological ultrasound etc.

d. Integration:

The teaching should be aligned and integrated horizontally and vertically in order

to provide comprehensive care for women in their reproductive years and beyond, based on a sound knowledge of structure, functions and disease and their clinical, social, emotional, psychological correlates in the context of national health priorities. The student shall be able to integrate clinical skills with other disciplines and bring about coordination of family welfare programme for the national goal of population control.

18. ORTHOPAEDICS (INCLUDING TRAUMA)

a. Competencies:

- The student must demonstrate:
- Ability to recognize and assess bone injuries, dislocation and poly-trauma and provide first contact care prior to appropriate referral,
- Knowledge of the medico-legal aspects of trauma,
- Ability to recognize and manage common infections of bone and joints in the primary care setting,
- Recognize common congenital, metabolic, neoplastic, degenerative and inflammatory bone diseases and refer appropriately,
- Ability to perform simple orthopedic techniques as applicable to a primary care setting,
- Ability to recommend rehabilitative services for common orthopaedic problems across all ages.

b. Broad subject specific objectives

Knowledge:

The student shall be able to understand:

- The principles, diagnosis and primary management and be able to give appropriate referral for further definitive management of bones and joint injuries.

- Osteogenesis, manifestation and diagnosis, primary management and give their referral for appropriate correction or rehabilitation of common musculoskeletal disorders including infections of bones and joints; congenital skeletal anomalies, metabolic bone diseases and neoplasm affecting bones.

c. Skills

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

- Detect soft tissue injuries such as sprains and strains.
- Detect common fractures of extremities.
- Deliver first aid measures for common fractures and sprains.
- Deliver emergency measures to poly trauma patients.
- Manage uncomplicated fractures of clavicle, forearm, phalanges etc.
- Use techniques of splinting such as application of Thomas splint, plaster slab and casts, immobilization by skin tractions etc.
- Learn indications for closed reductions, open reductions, internal fixation and external fixations of fracture.
- Manage common bone infection; learn indications for sequestration, amputation and corrective measures for bone deformities.
- Advice and counsel patient for rehabilitation for post traumatic, poliomyelitis, cerebral palsy and amputation.
- Be able to perform certain orthopedic skills, provide sound advice of skeletal and related conditions at primary or secondary health care level.

d. Integration:

The teaching should be aligned and integrated horizontally and vertically in order to allow the student to understand the structural basis of orthopedic problems, their management and correlation with function, rehabilitation and quality of life.

19. ANAESTHESIOLOGY

a. Competencies:

The student must demonstrate ability to:

- Describe and discuss the pre-operative evaluation, assessing fitness for surgery and the modifications in medications in relation to anesthesia /surgery,
- Describe and discuss the roles of Anesthesiologist as a peri-operative physician including pre-medication, endotracheal intubation, general anesthesia and recovery (including variations in recovery from anesthesia and anaesthetic complications),
- Describe and discuss the management of acute and chronic pain, including labour analgesia,
- Demonstrate awareness about the maintenance of airway in children and adults in various situations,
- Demonstrate the awareness about the indications, selection of cases and execution of cardio- pulmonary
- Resuscitation in emergencies and in the intensive care and high dependency units,
- Choose cases for local / regional anesthesia and demonstrate the ability to administer the same,
- Discuss the implications and obtain informed consent for various procedures and to maintain the documents.

b. Broad subject specific objectives:

Knowledge:

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

- Know of simple nerve block and pain relief
- Awareness of the principles of administration of general, regional and local anesthesia.

- Know importance of hypoglycemia/hyperglycemia, hypotension/hypertension, IHD, Myocardial infarction.
- Know ventilators.

c. Skills

At the end of the training, the students should be able to:

- Perform cardio-pulmonary resuscitation with the available resources and transfer the patients to a bigger hospital for advanced life support.
- Set up intravenous infusion and manage fluid therapy
- Clear and maintain airway in unconscious patient.
- Administer oxygen correctly
- General knowledge about diagnosis of brain death and relevance in deceased donor organ transplantation

d. Integration: The teaching should be aligned and integrated horizontally and vertically in order to provide comprehensive care for patients undergoing various surgeries, in patients with pain, in intensive care and in cardio respiratory emergencies. Integration with the departments of Anatomy, Pharmacology and horizontal integration with any/all surgical specialties is proposed.

20. RADIODIAGNOSIS

a. Competencies: The student must demonstrate:

- Understanding of indications for various radiological investigations in common clinical practice,
- Awareness of the ill effects of radiation and various radiation protective measures to be employed,

- Ability to identify abnormalities in common radiological investigations.

b. Broad subject specific objectives:

Knowledge:

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

- Enlist and describe the various diagnostic modalities
- Delineate normal and abnormal radiological findings
- Understand basic radiology and emphasize on its clinical applications
- Describe radiographic, ultra sonographic, CT, MRI features of common pathologies.
- Describe and integrate radiological findings in CNS, GIT, RS, CVS, MSK, GUT

d. Skills

- At the end of the course, the student shall be able to:
- Make use of Imaging findings to reach to a diagnosis;
- Analysis and interpret radiological data;
- Demonstrate the skills of solving clinical problems by illustrative evidences and decision making.

- e. Integration:** Horizontal and vertical integration to understand the fundamental principles of radiologic imaging, anatomic correlation and their application in diagnosis and therapy.

B. PHASE WISE TRAINING AND TIME DISTRIBUTION FOR PROFESSIONAL DEVELOPMENT

The Competency based Undergraduate Curriculum and Attitude, Ethics and Communication (AETCOM) course, as published by the Medical Council of India and also made available on the Council's website, shall be the curriculum for the batches admitted in MBBS from the academic year 2019-20 onwards.

In order to ensure that training is in alignment with the goals and competencies required for a medical graduate, there shall be a **Foundation Course** to orient medical learners to MBBS programme, and provide them with requisite knowledge, communication (including electronic), technical and language skills.

I. Training period and time distribution:

Universities shall organize admission timing and admission process in such a way that teaching in the first Professional year commences with induction through the Foundation Course by the 1st of August of each year from academic year 2024-25. There shall be no admission of students in respect of any academic session beyond 30th August from academic year 2024-25. The Universities shall not register any student admitted beyond the said date.

The National Medical Commission may direct, that any student identified as having Obtained admission after the last date for closure of admission be discharged from the Course of study, or any medical qualification granted to such a student shall not be a recognized qualification by National Medical Commission.

The institution which grants admission to any student after the last date specified from the same shall also be liable to face such action as may be prescribed by National Medical Commission.

Every learner shall undergo a period of certified study extending over 4 ½ academic years, divided into four professional years from the date of commencement of course to the date of completion of examination which shall be followed by one year of compulsory rotating internship.

Each academic year will have at least 39 teaching weeks with a minimum of eight hours of working on each day including one hour as lunch break.

Didactic lectures shall not exceed one third of the schedule; two third of the schedule shall include interactive sessions, practicals, clinical or/and group discussions. The learning process should include clinical experiences, problem- oriented approach, case studies and community health care activities.

Teaching and learning shall be aligned and integrated across specialties both vertically and horizontally for better learner comprehension. Learner centered learning methods should include Early Clinical Exposure, problem-oriented learning, case studies, community- oriented learning, self- directed, experiential learning& Electives

At the end of each professional year university examination will be conducted. If any student fails to clear university examination, he will appear in supplementary examination.

Supplementary examinations and declaration of results shall be processed within 3-6 weeks from the date of declaration of the results of the main examination for every professional year, so that the candidates, who pass, can join the main batch for progression.

If the candidate fails in the supplementary examination of first MBBS, he shall join the batch of next academic /subsequent year. There shall be no supplementary batches. Partial attendance of examination in any subject shall be counted as an attempt.

- **A candidate, who fails in the First Professional examination, shall not be allowed to join the Second Professional.**
- **A candidate, who fails in the second Professional examination, shall be allowed to join the third Professional Part I training, however he shall not be allowed to appear for the examination unless he has passed second professional examination.**
- **A candidate who fails in the third Professional (Part I) examination shall be**

allowed to join third Professional part II training, however he shall not be allowed to appear for the examination unless he has passed second professional examination.

II. The period of 4½ years is divided as follows:

Phase I –Total 12 months

i) First Professional phase of 12 months including Foundation Course of one week and university exams. It shall consist of – Anatomy, Physiology, Biochemistry, Introduction to Community Medicine, Humanities, Professional development including Attitude, Ethics & Communication (AETCOM) module, family adoption programme through village outreach where-in each student shall adopt minimum of three (03) families and preferably at least five (05) families, Pandemic module and early clinical exposure, ensuring alignment & all types of integration and simulation- based learning.

Phase II- Second Professional (12 months) including university exams. It will consist of Pathology, Pharmacology, Microbiology, family visit under Community Medicine, General Surgery, General Medicine & Obstetrics & Gynecology Professional development including AETCOM module, simulation-based learning and introduction to clinical subjects ensuring both alignment & all types of integration.

The clinical exposure to learners will be in the form of learner-doctor method of clinical training in all phases. The emphasis will be on primary, preventive and comprehensive health care. A part of training during clinical postings should take place at the *primary level* of health care. It is desirable to provide learning experiences in secondary health care, wherever possible. This will involve:

- Experience in recognizing and managing common problems seen in outpatient, inpatient and emergency settings,
- Involvement in patient care as a team member,
- Involvement in patient management and performance of basic procedures.

iii) Phase III - 30 months

a. Third Professional Part I (12 months, including University exams)

Forensic Medicine and Toxicology, Community Medicine, Medicine & allied, Surgery & allied, Pediatrics and Obstetric & Gynecology including AETCOM, Pandemic module, Clinical teaching in General Medicine, General Surgery, Obstetrics & Gynecology, Pediatrics, Orthopedics, Dermatology, Community Medicine, Psychiatry, Respiratory Medicine, Radio-diagnosis (& Radiotherapy) and Anesthesiology & Professional development.

b. Electives (1 month) shall be included here. These will be in 2 blocks of 15 days each in Final first; 1st block after annual exam of III MBBS part 1 and 2nd block after the end of 1st elective.

c. Third Professional Part II (18 months, including University exam)-

Subjects include:

- | | |
|--|---|
| • | M |
| edicine and allied specialties (General Medicine, Psychiatry, Dermatology, Venereology and Leprosy (DVL), Respiratory Medicine including Tuberculosis) | |
| • | S |
| urgery and allied specialties (General Surgery, Otorhinolaryngology, Ophthalmology, Orthopedics, Dentistry, Physical Medicine and rehabilitation, Anesthesiology and Radiodiagnosis) | |
| • | O |
| bstetrics and Gynecology (including Family Welfare) | |
| • | P |
| ediatrics | |
| • | A |
| ETCOM module | |

III. Distribution of teaching hours phase wise

a. First, second and third Professional part-I, teaching hours:

Time allotted: 12 months (approx. 52weeks)

Time available: Approx. 39 weeks (excluding 13 weeks) (39 hours/ week)

Prelim / University Exam & Results: 9 weeks

Vacation: 2 weeks

Public Holidays: 2 weeks

Time distribution in weeks: 39 weeks x 39 hours = 1521 hours for Teaching- Learning

b. Final MBBS part-2, teaching hours:

Time allotted: 18 months (approx. 78 weeks)

Time available: Approx. **62 weeks** (excluding 16 weeks) (39 hours/ week)

Prelim / University Exam & Results: 10 weeks

Vacation: 3 weeks

Public Holidays: 3 weeks

Time distribution in weeks: 62 x 39 hrs = 2418 hrs available for Teaching- Learning

(Clinical Postings: 15 hours/ week II MBBS onwards included in academic schedule)

These are attached in sperate annexure with all relevant tables.

Academic calender shall be as per the Table 1.

Distribution of subjects for Professional Phase – wise training is given in Table 2.

Minimum teaching hours prescribed in various disciplines are given in Tables 3-7.

Distribution and duration of clinical postings is given in Table 8.

Time allotted excludes time reserved for internal /University examinations, and vacation.

Second professional clinical postings shall commence before / after declaration of results of the first professional phase examinations, as decided by the institution/ University.

Third Professional parts I and part II clinical postings shall start no later than two weeks after the completion of the previous professional examination.

A total of 25% of allotted time of third Professional shall be utilized for integrated learning with phase I and II subjects. This will be included in the assessment of clinical subjects.

Note

- The period of training is minimum suggested. Adjustments where required depending on availability of time may be made by the concerned college/ institution. This period of training does not include university examination period.
- An exposure to skills lab for at least two (02) weeks prior to clinical postings shall be made available to all student.

C) New teaching /learning elements

1) Foundation Course

Goal: The goal of the Foundation Course is to prepare a learner to study medicine effectively.

Objectives:

- (a) Orient the learner to:**
 - The medical profession and the physician's role in society
 - The MBBS programme
 - Alternate health systems i.e. AYUSH in India and history of Medicine
 - Medical ethics, attitudes and professionalism
 - Health care system and its delivery
 - National health programmes and policies
 - Universal precautions and vaccinations
 - Patient safety and biohazard safety
 - Principles of primary care (general and community based care)
 - The academic ambience
- (b) Enable the learner to acquire enhanced skills in:**
 - Language
 - Interpersonal relationships

- Communication
- Learning including self-directed learning
- Time management
- Stress management
- Use of information technology, and artificial intelligence

(c) **Train the learner to provide:**

- First-aid
- Basic life support
- In addition to the above, learners maybe enrolled in one of the following programmes which will be run concurrently:
 - Local language programme
 - English language programme
 - Computer skills
- These may be done in the last two hours of the day. These sessions must be as interactive as possible.

Sports (to be used through the Foundation Course as protected 04 hours /week).

Leisure and extracurricular activity (to be used through the Foundation Course as projected 02 hours per week).

Institutions shall develop learning modules and identify the appropriate resource persons for their delivery.

The time committed for the Foundation Course may not be used for any other curricular activity.

The Foundation Course shall have a minimum of 75% attendance of all students mandatorily. This will be certified by the Dean of the college.

The Foundation Course shall be organized by the Coordinator appointed by the Dean

of the college and shall be under supervision of the Heads of MBBS phase 1 departments.

Every college shall arrange for a meeting with parents/ wards of all students and records of the same shall be made available to UGMEB of NMC.

2) Early Clinical Exposure

Objectives: The objectives of early clinical exposure of the first-year medical learners are to enable the learner to:

- Recognize the relevance of basic sciences in diagnosis, patient care and management,
- Provide a context that will enhance basic science learning,
- Relate to experience of patients as a motivation to learn,
- Recognize attitude, ethics and professionalism as integral to doctor-Patient relationship,
- Understand the socio-cultural context of disease through the study of humanities.

Elements

- Basic science correlation: i.e. apply and correlate principles of basic sciences as they relate to patient care (this shall be part of integrated modules).
- Clinical skills: to include basic skills in interviewing patients, doctor-patient communication, ethics and professionalism, critical thinking and analysis and self-learning (this training shall be imparted in the time allotted for early clinical exposure).
- Humanities: To introduce learners to a broader understanding of the socio-economic framework and cultural context within which health is delivered through the study of humanities and social sciences.

3) Electives

Objectives: To provide the learner with opportunities:

- For diverse learning experiences,
- It is mandatory for learners to do an elective. The elective time shall not be used to make up for missed clinical postings, shortage of attendance or other purposes.
- Institutions will pre-determine the number and nature of electives, names of the supervisors, and the number of learners in each elective based on the local conditions, available resources and faculty.
- Electives on topics in areas such as Research methodology, Use of Artificial intelligence and computers in Health and Medical Education, Health Management, Health economics, Indian system of medicine, Medical photography /clinical photography, Global health, Evidence based medicine, Art and music in medicine, Literary activities, etc. may be provided by the college/ institution.
 - It shall be preferable that elective choices are made available to the learners in the beginning of the academic year.
 - The learner must submit a learning log book based on both blocks of the electives.
 - 75% attendance in the electives and submission of log book maintained during electives is required for eligibility to appear in the final MBBS examination/ NEXT.
 - Institutions may use part of this time for strengthening basic skill certification.

4) Professional Development including Attitude, Ethics and Communication Module

(AETCOM)

Objectives of the programme: At the end of the programme, the learner must demonstrate ability to:

- Understand and apply principles of bioethics and law as they apply to medical practice and research, understand and apply the principles of clinical reasoning as they apply to the care of the patients,
- Understand and apply the principles of system-based care as they relate to the care of the patient,
- Understand and apply empathy and other human values to the care of the patient,
- Communicate effectively with patients, families, colleagues and other health care professionals,
- Understand the strengths and limitations of alternative systems of medicine,
- Respond to events and issues in a professional, considerate and humane fashion,
- Translate learning from the humanities in order to further his professional and personal growth.

Learning experiences:

- This will be a longitudinal programme spread across the continuum of the MBBS programme including internship,
- Learning experiences shall include small group discussions, patient care scenarios, workshops, seminars, role plays, lectures etc.
- Attitude, Ethics & Communication Module (AETCOM module) developed by the erstwhile Medical Council of India should be used longitudinally for purposes of instruction.
- 75% attendance in Professional Development Programme (AETCOM Module) shall be mandatory for eligibility to appear for final examination in each professional year.

Internal Assessment shall include:

- Written tests comprising of short notes and creative writing experiences,

OSCE based clinical scenarios /viva voce.

- At least one question in each paper of each clinical specialty in the University examination shall test knowledge competencies acquired during the professional development programme.
- Skill competencies acquired during the Professional Development Programme must be tested during the clinical, practical and viva voce.

5) Learner-doctor method of clinical training (Clinical Clerkship)

a. Goal: To provide learners with experience in:

- Longitudinal patient care,
- Being part of the health care team,
- Hands-on care of patients in outpatient and in-patient setting.

b. Structure:

- The first clinical posting in second professional shall orient learners to the patient, their roles and the specialty.
- The learner-doctor programme shall progress as outlined in Table 9.
- The learner shall function as a part of the health care team with the following responsibilities:
 - Be a part of the units' out-patient services on admission days,
 - Remain with the admission unit until at least 6 PM except during designated class hours,
 - Be assigned patients admitted during each admission day for whom he will undertake responsibility, under the supervision of a senior resident or faculty member,

- Participate in the unit rounds on its admission day and will present the assigned patients to the supervising physician,
- Follow the patient's progress throughout the hospital stay until discharge,
- Participate, under supervision, in procedures, surgeries, deliveries etc. of assigned patients,
- Participate in unit rounds on at least one other day of the week excluding the admission day,
- Discuss ethical and other humanitarian issues during unit rounds,
- Attend all scheduled classes and educational activities,
- Document his observations in a prescribed log book /case record.

No learner will be given independent charge of the patient in the capacity of primary physician of the concerned patient.

The supervising physician shall be responsible for all patient care decisions and guide the learner from time to time as required.

6) Assessment:

- A designated faculty member in each unit will coordinate and facilitate the activities of the learner, monitor progress, provide feedback and review the log book/ case record.
- The log book/ case record must include the written case record prepared by the learner including relevant investigations, treatment and its rationale, hospital course, family and patient discussions, discharge summary etc.
- The log book shall also include records of outpatients assigned. Submission of the log book/ case record to the department is required for eligibility to appear for the final examination of the subject.

D) Assessment

I. Eligibility to appear for Professional examinations

The performance in essential components of training are to be assessed, based on:

(a) Attendance

- There shall be a minimum of 75% attendance in theory and 80% in practical /clinical for eligibility to appear for the examinations in that subject. In subjects that are taught in more than one phase – the learner must have 75% attendance in theory and 80% in practical in each phase of instruction in that subject. There shall be minimum of 80% attendance in family visits under Family adoption programme. Each student shall adopt minimum 3 families and preferably five families. The details shall be as per Family Adoption Program guidelines.
- If an examination comprises more than one subject (for e.g., General Surgery and allied branches), the candidate must have a minimum of 75% attendance in each subject including its allied branches, and 80% attendance in each clinical posting.
- Learners who do not have at least 75% attendance in the electives will not be eligible for the Third Professional - Part II examination/ NEXT.

(b) Internal Assessment: Internal assessment shall be based on day-to-day assessment. It shall relate to different ways in which learners participate in learning process including assignments, preparation for seminar, clinical case presentation, preparation of clinical case for discussion, clinical case study/ problem solving exercise, participation in project for health care in the community. Internal assessment shall not be added to summative assessment. However, internal assessment should be displayed under a separate column in detailed marks card.

(c) Learners must have completed the required certifiable competencies for that phase of training and completed the log book

appropriate for that phase of training to be eligible for appearing at the final university examination of that subject.

(d) Regular periodic examinations shall be conducted throughout the course. There shall be no less than three internal assessment examinations in each subject of first and second professional year, and no less than two examinations in each subject of final professional year. An end of posting clinical assessment shall be conducted for each clinical posting in each professional year.

- When subjects are taught in more than one phase, the internal assessment must be done in each phase and must contribute proportionately to final assessment. For example, General Medicine must be assessed in second Professional, third Professional Part I and third Professional Part II, independently.
- Day to day records and log book (including required skill certifications) should be given importance in internal assessment. Internal assessment should be based on competencies and skills.
- The final internal assessment in a broad clinical specialty (e.g., Surgery and allied specialties etc.) shall comprise of marks from all the constituent specialties. The proportion of the marks for each constituent specialty shall be determined by the time of instruction allotted to each.
- Learners must secure at least 50% marks of the total marks (combined in theory and practical / clinical; not less than 40% marks in theory and practical separately) for internal assessment in a particular subject in order to be eligible for appearing at the final University examination of that subject. Internal assessment marks will reflect as separate head of passing at the summative examination.
- The results of internal assessment should be displayed on the notice board within one week of the test.
- Universities shall guide the colleges regarding formulating policies for remedial measures for students who are either not able to score qualifying marks or have missed on some assessments due to any reason.

II. University Examinations:

University examinations are to be designed with a view to ascertain whether the candidate has acquired the necessary knowledge, minimal level of skills, ethical and professional values with clear concepts of the fundamentals which are necessary for him/her to function effectively and appropriately as a physician of first contact. Assessment shall be carried out on an objective basis to the extent possible.

- Nature of questions shall include different types such as structured essays (Long-Answer Questions -LAQ), Short-Answer Questions (SAQ) and objective type questions (e.g. Multiple Choice Questions - MCQ). Marks for each part shall be indicated separately. MCQs shall be accorded a weightage of not more than 20% of the total theory marks. Practical /clinical examinations shall be conducted in the laboratories and /or hospital wards. The objective will be to assess proficiency and skills to conduct experiments, interpret data and form logical conclusion. Clinical cases kept in the examination must be common conditions that the learner may encounter as a physician of first contact in the community. Selection of rare syndromes and disorders as examination cases is to be discouraged. Emphasis should be on candidate's capability to elicit history, demonstrate physical signs, write a case record, analyze the case and develop a management plan.
- Viva/oral examination should assess approach to patient management, emergencies, and attitudinal, ethical and professional values. Candidate's skill in interpretation of common investigative data, X-rays, identification of specimens, ECG, etc. is to be also assessed.

University Examinations shall be held as under:

(a) First Professional

The first Professional examination shall be held at the end of first Professional training (in the 12th month of that training), in the subjects of Anatomy, Physiology and Biochemistry.

(b) Second Professional

The second Professional examination shall be held at the end of second

professional training (12th month of that training), in the subjects of Pathology, Microbiology, and Pharmacology.

(c) Third Professional

- Third Professional Part I examination shall be held at end of third Professional part 1 of training (12th month of that training) in the subjects of Community Medicine, and Forensic Medicine including Toxicology
- Third Professional Part II / National Exit Test (NExT) as per NExT regulations- (Final Professional) examination shall be at the end of 17th / 18th month of that training, in the subjects of General Medicine, General Surgery, Ophthalmology, Otorhinolaryngology, Obstetrics & Gynecology, and Pediatrics, and allied subjects as per NExT REGULATIONS.

Note:

- At least one question in each paper of each PHASE shall test the knowledge, and competencies acquired during the professional development programme (AETCOM module).
- Skills competencies acquired during the Professional Development Programme (AETCOM module) shall be tested during clinical, practical and viva.

In subjects that have two papers, the learner must secure minimum 50% of marks in aggregate (both papers together) to pass in the said subject.

Criteria for passing in a subject: A candidate shall obtain 50% marks in University conducted examination separately in Theory and in Practical (practical includes: practical/ clinical and viva voce) in order to be declared as passed in that subject.

Appointment of Examiners

- **Person appointed as an examiner in the particular subject must have at least four years of total teaching experience as Assistant Professor after obtaining postgraduate degree following MBBS, in the subject in a**

college affiliated to a recognized medical college (by UGMEB of NMC).

- For Practical /Clinical examinations, there shall be at least four examiners for every learner, out of whom not less than 50% must be external examiners. Of the four examiners, the senior-most internal examiner shall act as the Chairman and coordinator of the whole examination programme so that uniformity in the matter of assessment of candidates is maintained.
 - A University having more than one college shall have separate sets of examiners for each college, with internal examiners from the concerned college. External examiner may be from outside the college/ university/ state/ union territory.
 - There shall be a Chairman of the Board of paper-setters who shall be an internal examiner and shall moderate the questions.
 - All eligible examiners with requisite qualifications and experience can be appointed internal examiners by rotation in their subjects.
 - All theory paper assessment should be done as central assessment program (CAP) of concerned university.
 - Internal examiners shall be appointed from the same institution for unitary examination in the same institution. For pooled examinations at one centre, the approved internal examiners from same university may be appointed.
 - The Examiners for General Surgery and allied subjects as well as for General Medicine and allied subjects, shall be from General Surgery and General Medicine respectively.
 - There shall be no grace marks to be considered for passing in an examination.
-

ANNEXURES:

1. COMPETENCIES
2. TABLES RELATED TO CBME/ CURRICULUM, ASSESSMENTS
3. FAMILY ADOPTION PROGRAMME
4. GUIDELINES FOR MANPOWER REQUIREMENT FOR RESEARCH FACILITIES
5. DISABILITY CRITERIA FOR ADMISSION TO MBBS

AETCOM COMPETENCIES

AETCOM Competencies for First MBBS

Subject	Competency Number	Competency
Anatomy	Module 1.5	The cadaver as our first teacher Demonstrate respect and follow the correct procedure when handling cadavers and other biologic tissue
	Module 1.1	Identify, discuss Physician's role and responsibility to society and the community that she/he serves
Physiology	Module 1.2, Module 1.3	Demonstrate empathy in patient encounters
	Module 1.4	Demonstrate ability to communicate to patients in a patient, respectful, non- threatening, non-judgmental and empathetic manner
Biochemistry	Module 1.1,	Enumerate and Describe the role of a physician in health care system
	Module 1.1	Describe and discuss the commitment to lifelong learning as an important part of physician growth

AETCOM Competencies for Second MBBS

Subject	Competency Number	Competency
Pathology	2.6	Identify, discuss and defend medico-legal, socio-cultural and ethical issues as they pertain to refusal of care including do not resuscitate and withdrawal of life support.
	2.4 A	Demonstrate ability to work in a team of peers and superiors.
	2.4 B	Demonstrate respect in relationship with patients, fellow team members, superiors and other health care workers.
	2.7	Identify, discuss and defend, medico-legal, socio-cultural and ethical issues as they pertain to consent for surgical procedures.
Microbiology	Module 2.2 A	Describe and discuss the role of non-maleficence as a guiding principle in patient care
	Module 2.2 B	Describe and discuss the role of autonomy and shared responsibility as a guiding principle in patient care
	Module 2.2 C	Describe and discuss the role of beneficence of a guiding principle inpatient care
	Module 2.2 D	Describe and discuss the role of a physician in health care system
	Module 2.2 E	Describe and discuss the role of justice as a guiding principle in patient Care
	Module 2.3	Describe and discuss the role of justice as a guiding principle in patient care
	Module 2.5	Identify, discuss and defend medico-legal, socio-cultural and ethical issues as it pertains to patient autonomy, patient rights and shared responsibility in health care
Pharmacology	Module 2.1	Demonstrate ability to communicate to patients in a patient, respectful, non-threatening, non-judgmental and empathetic manner.
	Module 2.8	Demonstrate empathy in patient encounters.

AETCOM Competencies for Third Year (Part I)

Subject	Competency Number	Competency
Ophthalmology	3.1	Demonstrate ability to communicate to patients in a patient, respectful, nonthreatening, non-judgmental and empathetic manner
	3.2	Demonstrate an understanding of the implications and the appropriate procedure and response to be followed in the event of medical error
ENT	3.3 A	Demonstrate ability to communicate to patients in a patient, respectful, nonthreatening, non-judgmental and empathetic manner
	3.3 B	Identify, discuss and defend, medico-legal, socio-cultural and ethical issues as they pertain to consent for surgical procedures
Forensic Medicine & Toxicology	3.3 C	Administer informed consent and appropriately address patient queries to a patient undergoing a surgical procedure in a simulated environment
	3.4	Identify, discuss and defend medico-legal, socio-cultural and ethical issues as it pertains to confidentiality in patient care
Community Medicine	3.5 A	Identify, discuss and defend medico-legal, socio-cultural, professional and ethical issues as it pertains to the physician - patient relationship (including fiduciary duty)
	3.5 B	Identify and discuss physician's role and responsibility to society and the community that she/ he serves

AETCOM Competencies for Third Year (Part II)

Subject	Competency Number	Competency
Medicine and Allied Subjects	4.1 A	The student should be able to: Demonstrate ability to communicate to patients in a patient, respectful, nonthreatening, non-judgmental and empathetic manner
	4.1 B	The student should be able to: Communicate diagnostic and therapeutic options to patient and family in a simulated environment
	4.3	The student should be able to: Identify and discuss medico-legal, socio-economic and ethical issues as it pertains to organ donation
Surgery and Allied Subjects	4.4 A	The student should be able to: Demonstrate empathy in patient encounters
	4.4 B	The student should be able to: Communicate care options to patient and family with a terminal illness in a simulated environment
	4.5	The student should be able to: Identify and discuss and defend medico-legal, socio-cultural, professional and ethical issues in physician - industry relationships
	4.6	The student should be able to: Identify conflicts of interest in patient care and professional relationships and describe the correct response to these conflicts
Obstetrics and Gynecology	4.2	The student should be able to: Identify, discuss and defend medico-legal, socioeconomic and ethical issues as it pertains to abortion / Medical Termination of Pregnancy and reproductive rights
	4.7	The student should be able to: Identify conflicts of interest in patient care and professional relationships and describe the correct response to these conflicts
	4.8 A	The student should be able to: Identify conflicts of interest in patient care and professional relationships and describe the correct response to these conflicts.

	4.8 B	The student should be able to: Demonstrate empathy to patient and family with a terminal illness in a simulated environment.
Pediatrics	4.9 A	The student should be able to: Identify, discuss and defend medico-legal, socio-cultural, professional and ethical issues pertaining to medical negligence
	4.9 B	The student should be able to: Identify, discuss and defend medico-legal, socio-cultural, professional and ethical issues pertaining to malpractice

Table1: Time distribution of MBBS Programme & Examination Schedule

Proposed Academic Calendar for CBME 2023-24 Batch 2023

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2023									1	2	3	4
2024	5	6	7	8	9	10	11	12-1st Prof, exam, result	13- 2 nd MBBS	14	15	16
2025	17	18	19	20	21	22	23	24- 2 nd Prof exam, result	25- Final 1st	26	27	28
2026	29	30	31	32	33	34	35	36- Final 1 st exam, result	37- Final 2 nd	38	39	40
2027	41	42	43	44	45	46	47	48	49	50	51	52
2028	53	54 NEXT-1	1- CRM	2	3	4	5- 2 nd propose d NEXT	6	7	8	9	10
2029	11	12-NEXT-Step 2										

Legends:

AETCOM: Attitude, Ethics and Communication skills

FAP: Family Adoption Programme (village outreach)

SDL: Self Directed Learning

SGL: Small Group Learning (tutorials/ Seminars/ Integrated Learning)

PCT (mentioned in Assessments): Part Completion Test

Table2: Distribution of subjects in each Professional Phase

Phase & year of MBBS training	Subjects & Teaching Elements	Duration (months)	University Examination
First Professional MBBS	(i) Foundation course -1 week, remaining spread over 6 months at the discretion of college (ii) Anatomy, Physiology & Biochemistry, Introduction to Community Medicine, including Family adoption programme (FAP) through village outreach (iii) Early Clinical Exposure (iv) Attitude, Ethics, and communication Module (AETCOM) including Humanities	12 months	1 st professional
Second Professional MBBS	(i) Pathology, Microbiology, Pharmacology (ii) Introduction to clinical subjects (iii) Clinical postings, Family visits for FAP (iv) AETCOM	12 months	2 nd professional
Third Professional part 1, MBBS, including Electives 1 month	(i) Community Medicine, Forensic Medicine and Toxicology, Medicine & allied, Surgery & allied, Pediatrics, Obstetrics & Gynecology (ii) Family visits for FAP (iii) Clinical postings (iv) AETCOM (v) Electives- 1 month, 2 blocks, 15 days each	12 months	Final professional - Part I
Third Professional part 2, MBBS	(i) General Medicine, Dermatology, Psychiatry, Respiratory medicine, Pediatrics, General Surgery, Orthopedics, Oto-rhinolaryngology, Ophthalmology, Radiodiagnosis, Anesthesiology, Obstetrics & Gynecology (ii) Clinical postings (iii) AETCOM	18 months	Final Professional - Part II

Table 3: Foundation Course

(one week + spread over 6 months at the discretion of college)

Subjects/Contents	Teaching hours
Orientation	30
Skills Module	34
Field visit to Community Health Center	08
Introduction to Professional Development & AETCOM module	40
Sports, Yoga and extra-curricular activities	16
Enhancement of language/computer skills	32
Total	160

Table no. 4 Distribution of Subject Wise Teaching Hours for 1st MBBS

Subject	Lectures	SGL	SDL	Total
Foundation Course				39
Anatomy	210	400	10	620
Physiology	130	300	10	440
Biochemistry *	78	144	10	232
Early Clinical Exposure**	27	-	0	27
Community Medicine	20	20		40
FAP			27	27
(AETCOM)***	-	26	-	26
Sports and extra-curricular activities	-	-	-	10
Formative Assessment and Term examinations	-	-	-	60
Total	464	918	30	1521 #

* Including Molecular Biology

** Early Clinical exposure hours to be divided equally in all three subjects.

***AETCOM module shall be a longitudinal programme.

Includes hours for Foundation course also

Table no. 5- Distribution of Subject Wise Teaching Hours for II MBBS

Subjects	Lectures	SGL	Clinical Postings*	SDL	Total
Pathology	80	165	-	10	255
Pharmacology	80	165	-	10	255
Microbiology	70	135	-	10	215
Community Medicine	15	0	0	10	25
FAP	0	0	30		30
Forensic Medicine and Toxicology	12	22	-	08	42
Clinical Subjects	59		540	-	599
AETCOM	-	29	-	8	37
Sports, Yoga and extra-curricular activities	-	-	-	20	35
Pandemic module				28	28
Final total	316	516	585	104	1521

Pl. note: Clinical postings shall be for 3 hours per day, Monday to Friday.

There will be 15 hours per week for all clinical postings.

Table no. 6 - Distribution of Subject Wise Teaching Hours for Final MBBS part 1.

Subject	Lectures	SGL	SDL	Total
Electives	0	156	0	156
Gen. Med.	30	50	10	90
Gen Surgery	30	50	10	90
Obs. & Gyn	30	50	10	90
Pediatrics	25	30	10	65
Orthopedics	15	20	10	45
For. Med.& Tox.	40	70	20	130
Community Med	55	70	20	145
FAP (Visits +log book submission)	-	21	10	31
Otorhinolaryngology (ENT)	15	20	10	45
Ophthalmology	15	20	10	45
Clinical posting			540	540
AETCOM	0	19	12	31
Pandemic module	18	0	0	18
Total	273	546	672	1521

**Table 7: Distribution of Subject wise Teaching Hours for
Third professional part-2/ Final MBBS**

Subjects	Lectures	SGL	SDL	Total
General Medicine	95	155	55	260
General Surgery	80	140	40	260
Obstetrics and Gynecology	80	140	40	260
Pediatrics	30	60	30	120
Orthopedics	25	35	25	85
AETCOM	30	0	22	52
Dermatology	15	10	15	40
Psychiatry	15	15	15	45
Otorhinolaryngology (ENT)	15	25	15	55
Ophthalmology	15	25	15	55
Radiodiagnosis	8	15	15	38
Anesthesiology	8	15	15	38
Pandemic module	28	-	-	28
TOTAL	444	610	302	1356

Extra hours may be used for preparation of NExT or SDL.

Table no. 8: Clinical Posting Schedules in weeks

Subjects	Period of training in weeks			Total Weeks
	II MBBS	III MBBS Part I	III MBBS Part II	
Electives	0	4	0	4
General Medicine	9	4	14	27
General Surgery	7	4	10	21
Obstetrics & Gynaecology	7	4	10	21
Pediatrics	4	4	5	13
Community Medicine	4	4	0	8
Orthopaedics	2	2	4	8
Otorhinolaryngology	0	3	4	7
Ophthalmology	0	3	4	7
Psychiatry	0	2	4	6
Radio-diagnosis	0	0	2	2
Dermatology	2	2	2	6
Dentistry	1	0	0	1
Anaesthesiology	0	0	3	3
Total	36	36	62	134

Table 9: Learner- Doctor programme (Clinical Clerkship)

Year of Curriculum	Focus of Learner-Doctor programme
Year 1	Introduction to hospital environment, early clinical exposure, understanding perspectives of illness, family adoption program
Year 2	History taking, physical examination, assessment of change in clinical status, communication and patient education, family adoption program
Year 3	All of the above and choice of investigations, basic procedures and continuity of care
Year 4	All of the above (except Family adoption programme) and decision making, management and outcomes

Table 10 : Marks distribution for various subjects for University Annual Examinations

Phase of Course	Theory	Practicals	Passing criteria
1st MBBS			
Anatomy- 2 papers	Paper 1- 100	100	Mandatory to get 40% marks separately in theory and in practicals; and totally 50% for theory plus practicals.
	Paper 2 -100		
Physiology- 2 papers	Paper 1- 100	100	
	Paper 2 -100		
Biochemistry- 2 papers	Paper 1- 100	100	
	Paper 2- 100		
2nd MBBS			
Pathology - 2 papers	Paper 1- 100	100	
	Paper 2 -100		
Microbiology- 2 papers	Paper 1- 100	100	
	Paper 2- 100		
Pharmacology- 2 papers	Paper 1 -100	100	
	Paper 2- 100		
Final MBBS part 1			
Forensic Med. Tox.- 1 paper	Paper 1 - 100	50	
Community Med- 2 papers	Paper 1 -100	100	
	Paper 2- 100		

For NEXT, as per NEXT regulations.

Name of Institute:

DEPARTMENT OF Anatomy/Physiology/Biochemistry

Faculty : MBBS	Year/Phase- I	Date : dd/mm/yyyy
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Roll No.	Name of Student	Formative Assessment Theory			Continuous Internal assessment Theory						Total
		1st PCT Theory	2nd PCT Theory	Prelims Theory (Paper I & II)	Home Assignments	Continuous Class Test (LMS)	Self Directed Learning			Attendance Theory	
		100	100	200	15	30	15	15	15	10	500

Professor & Head
Department of _____
Name of Institute _____

Name of Institute :

Department of Anatomy/Physiology/Biochemistry

Faculty : MBBS	Year/Phase- I	Date : dd/mm/yyyy
-----------------------	----------------------	--------------------------

			Formative Assessment			Continuous Internal Assessment (Practical)													
S.No.	Roll No.	Name of Student	1st PCT Practical/First Ward Leaving Examination	2nd PCT Practical /Second Ward Leaving Examination	Prelims Practical	Log book (150)				Journal (Record book/ Portfolio)	Attendance (Practical)	Total							
						Certifiable skill based competencies (Through OSPE/OSCE/Spots/Exercise/Other)	AETCOM competencies	SVL Lab activity	Research										
			100	100	100								60	30	40	20	40	10	500

Professor & Head
 Department of _____
 Name of Institute _____

Name of Institute :

DEPARTMENT OF Pathology/Pharmacology/Microbiology

Faculty : MBBS

Year/Phase- II

			Formative Assessment Theory			Continuous Internal assessment Theory						
S.No.	Roll No.	Name of Student	1st PCT Theory	2nd PCT Theory	Prelims Theory (Paper I & II)	Home Assignmen t	Continuou s Class Test (LMS)	Seminar	Museum study	Library assignments	Attendance Theory	Total
			100	100	200	15	30	15	15	15	10	500
Professor & Head Department of _____ Name of Institute _____												

Professor & Head

Department of

Name of Institute

Name of Institute :

Department of Pathology/Pharmacology/Microbiology

Faculty : MBBS

Year/Phase- II

Date : dd/mm/yyyy

			Formative Assessment			Continuous Internal Assessment (Practical)								
S.No.	Roll No.	Name of Student	1st PCT Practical/First Ward Leaving Examination	2nd PCT Practical /Second Ward Leaving Examination	Prelims Practical	Log book (150)					Journal (Record book/ Portfolio)	Attendance (Practical)	Total	
						Certifiable skill based competencies (Through OSPE/OSCE/Spots/Exercise/ Other)	AETCOM competencies	SVL Lab activity	Research					
			100	100	100		60	30	40	20	40	10	500	
Professor & Head Department of _____ Name of Institute _____														

Professor & Head
Department of _____
Name of Institute _____

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DEPARTMENT OF Community Medicine

S.No.	Roll No.	Name of Student	Formative Assessment_Theory			Continuous Internal assessment_Theory						Total	Percentage Theory (Minimum cut off 40%)	Cumulative percent of Theory & Practical
			1st PCT Theory	2nd PCT Theory	Prelims Theory (Paper I & II)	Home Assignment	Seminar	Continuous Class Test (LMS)	Museum study	Library assignments	Attendance Theory			
			100	100	200	15	15	30	15	15	10	500	%	
1														
2														
3														

DEPARTMENT OF FMT

Faculty: MBBS,
Year/ Phase 3, part

1

S.No.	Roll No.	Name of Student	Formative Assessment_Theory			Continuous Internal assessment_Theory						Total	Percentage Theory (Minimum cut off 40%)	Cumulative percent of Theory & Practical
			1st PCT Theory	2nd PCT Theory	Prelims Theory (Paper I & II)	Home Assignment	Seminar	Continuous Class Test (LMS)	Museum study	Library assignments	Attendance Theory			
			100	100	100	10	10	25	10	10	10	375	%	
1														
2														
3														

S/d
Professor & Head
Department of _____
* Medical College
University
State/
U.T.

			Formative Assessment			Continuous Internal Assessment (Practical)							
			1st PCT Practical/First Ward Leaving Examination	2nd PCT Practical /Second Ward Leaving Examination	Prelims Practical	Log book (150)			Journal (Record book/ Portfolio)	Attendance (Practical)	Total	Percentage Practical (Minimum cut off 40%)	
S.No.	Roll No.	Name of Student				Certifiable skill based competencies (Through OSPE/OSCE/Spots/Exercise/Other)	Family Adoption Programme competencies In Comm. Med	AETCOM competencies					
			100	100	100	60	30	30	40	10	500	%	
1													
2													
3													

S/d
Professor & Head
Department of _____
* Medical College
University
State/ U.T.

			Formative Assessment			Continuous Internal Assessment (Practical)							
			1st PCT Practical/First Ward Leaving Examination	2nd PCT Practical /Second Ward Leaving Examination	Prelims Practical	Log book (150)			Journal (Record book/ Portfolio)	Attendance (Practical)	Total	Percentage Practical (Minimum cut off 40%)	
S.No.	Roll No.	Name of Student				Certifiable skill based competencies (Through OSPE/OSCE/Spots/Exercise/Other)	AETCOM competencies	SVL Lab activity					
			100	100	100	70	40	40	40	10	500	%	
1													
2													
3													

S/d
Professor & Head
Department of _____
* Medical College
University
State/ U.T.

Name of Institute :

Faculty : Final MBBS Year/Phase- Part - II

Date : dd/mm/yyyy

DEPARTMENT OF Paediatrics/ENT/Ophthalmology

S.No.	Roll No.	Name of Student	Formative Assessment_Theory			Continuous Internal assessment_Theory						Total
			1st PCT Theory	2nd PCT Theory	Prelims Theory (Paper I & II)	Home Assignment	Continuous Class Test (LMS)	Seminar	Museum study	Library assignments	Attendance Theory	
			100	100	100	10	25	10	10	10	10	375

Name of Institute :

Department of Paediatrics/ENT/Ophthalmology

Faculty : Final MBBS

Year/Phase- Part -II

Date : dd/mm/yyyy

Formative Assessment			Continuous Internal Assessment (Practical)									Total
S.No.	Roll No.	Name of Student	1st PCT Practical/First Ward Leaving Examination	2nd PCT Practical /Second Ward Leaving Examination	Prelims Practical	Log book (150)					Journal (Record book Portfolio)	
						Certifiable skill based competencies (Through OSPE/OSCE/Spots/Exercise/Other)	AETCOM competencies	SVL Lab activity	Research			
			100	100	100	60	30	50	20	40	10	500

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DEPARTMENT OF Medicine, Surgery, OBGY

Final MBBS Year-3, Part II

S.No.	Roll No.	Name of Student	Formative Assessment Theory			Continuous Internal assessment Theory						Attendance Theory	Total
			1st PCT Theory	2nd PCT Theory	Prelims Theory (Paper I & II)	Home Assignment	Continuous Class Test (LMS)	Self Directed Learning					
			100	100	200	15	30	15	15	15	10	500	

Professor & Head
Department of _____
Name of Institute _____

DEPARTMENT OF Medicine, Surgery, OBGY

Faculty : Final MBBS			Year/Phase- Part - II		Date : dd/mm/yyyy											
S.No.	Roll No.	Name of Student	Formative Assessment			Continuous Internal Assessment (Practical)										
			1st PCT Practical/First Ward Leaving Examination	2nd PCT Practical /Second Ward Leaving Examination	Prelims Practical	Log book (200)					Journal (Record book/Portf olio)	Attendance (Practical)	Total			
			100	100	200	Certifiable skill based competencies (Through OSPE/OSCE/Spots/Exercise/Other)	100	AETCOM competencies	40	SVL Lab activity	40	Research	20	40	10	650

Professor & Head

Department of _____

Name of Institute _____

National Medical Commission (Undergraduate Medical Education) Guidelines, 2023

CURRICULUM FOR FAMILY ADOPTION PROGRAMME

FAMILY ADOPTION PROGRAM:

This is being introduced with the aim of village outreach program for MBBS students. Every student shall ideally adopt 5(five) families. However, minimum 3(three) families are mandatorily to be adopted by every MBBS students. Every college may arrange one diagnostic medical camp in the village wherein identification of:

- a) anaemia, malnutrition in children, hypertension, diabetes mellitus, ischemic heart diseases, kidney diseases, any other local problems may be addressed.
- b) If required, patients shall be admitted in the hospital for acute illness under care of student, charges may be waived off or provide concession or govt. schemes.
- c) For chronic illness, students shall be involved.
- d) Subsidized treatment charges may be provided under govt. schemes or welfare schemes.
- e) Medical student may be allocated about 5 families and introduced in the first visit.
- f) Camps may be arranged by Dean and Community Medicine/ P.S.M. department with active involvement of Associate/ Asst. Professors, social worker and supporting staff. Local population may be involved with village leaders.
- g) Visit by students be made to the visit as mentioned in table below. Annual follow up diagnostic camp can be continued by the PSM department.

TARGETS TO BE ACHIEVED BY STUDENTS:

First Professional Year:

- a) Learning communication skills and inspire confidence amongst families
- b) Understand the dynamics of rural set-up of that region
- c) Screening programs and education about ongoing government sponsored health related programs
- d) Learn to analyse the data collected from their families
- e) Identify diseases/ ill-health/ malnutrition of allotted families and try to improve the standards

Second Professional Year

- a) Inspire active participation of community through families allotted
- b) Continue active involvement to become the first doctor /reference point of the family by continued active interaction
- c) Start compiling the outcome targets achieved

Third Professional Year

Analysis of their involvement and impact on existing socio-politico-economic dynamics in addition to improvement in health conditions

-Final visit to have last round of active interaction with families

-prepare a report to be submitted to department addressing:

- 1) Improvement in general health
- 2) Immunization
- 3) Sanitation,
- 4) De-addiction
- 5) Whether healthy lifestyles like reading good books, sports/ yoga activities have been inculcated in the house-holds.
- 6) Improvement in anaemia, tuberculosis control
- 7) Sanitation awareness
- 8) Any other issues
- 9) Role of the student in supporting family during illness/ medical emergency
- 10) Social responsibility in the form of environment protection programme in form of plantation drive (medicinal plants/trees), cleanliness and sanitation drives with the initiative of the medical student

Curriculum for Family Adoption Programme

Professional Year	Competency The student should be able to	Objectives	Suggested Teaching Learning methods	Suggested Assessment methods	Teaching Hours
1 st Professional	Collect demographic profile of allotted families, take history and conduct clinical examination of all family members	By the end of this visit, students should be able to compile the basic demographic profile of allocated family members	Family survey, Community clinics	Community case presentation, OSPE, logbook, journal of visit	6 hrs
	Organize health check-up and coordinate treatment of adopted family under overall guidance of mentor	By the end of this visit, students should be able to report the basic health profile and treatment history of allocated family members	Community clinics, Multispecialty camps	Community case presentation, OSPE, logbook, journal of visit	9 hrs
	Maintain communication & follow up of remedial measures	By the end of this visit, students should be able to provide details of communication maintained with family members for follow-up of treatment and	Reporting of follow up visits, PRA techniques (transact walk, group discussion) Community	Community case presentation, OSPE, logbook based of competency, journal of visit	6 hrs

	Take part in environment protection and sustenance activities.	suggested remedial measures By the end of this visit, students should be able to report the activities undertaken for environment protection and sustenance like study of environment of families, tree plantation, herbal plantation activities conducted in the village	clinics. Participation in and Process documentation of activities (NSS activities) along with reporting of photographic evidences	logbook certification competency, journal of visit based of	6hrs (Total 27 hrs, 9 visits)
2 nd Professional	- Take history and conduct clinical examination of all family members - Organize health check-up and coordinate treatment of adopted family under overall guidance of mentor	By the end of this visit, students should be able to compile the updated medical history of family members and report their vitals and anthropometry By the end of this visit, students should be able to report the details of clinical examination like Hb %, blood group, urine routine and blood sugar along with treatment history of allocated family members	Family survey, Community clinics Community clinics, Multispecialty camps	Community case presentation, OSPE, logbook, journal of visit Community case presentation, OSPE, logbook, journal of visit	6 hrs 9 hrs

	Maintain communication & follow up of remedial measures	By the end of this visit, students should be able to provide details of communication maintained with family members for follow-up of treatment, and suggested remedial measures along with details of vaccination drive	Reporting of follow up visits, PRA techniques (transact walk, group discussion) Community clinics,	Community case presentation, OSPE, logbook based certification of competency, journal of visit	9 hrs
	Take part in environment protection and sustenance activities.	By the end of this visit, students should be able to report the activities undertaken for environment protection and sustenance like study of environment of families, tree plantation herbal plantation activities conducted in the village	Participation in and Process documentation of activities (NSS activities) along with reporting of photographic evidences	logbook based certification of competency, journal of visit	6 hrs
					(Total 30 hrs, 10 visits)
3 rd Professional	Take history and conduct clinical examination of all family members	By the end of this visit, students should be able to update the medical history of family members and their vitals and anthropometry	Family survey, Community clinics	Community case presentation, OSPE, logbook, journal of visit	3hrs
	Organize health check-up and coordinate treatment of adopted family under overall guidance of mentor	By the end of this visit, students should be able to report the details of clinical examination like Hb %, blood group, urine	Community clinics, Multispecialty camps	Community case presentation, OSPE, logbook, journal of visit	3hrs

		routine and blood sugar along with treatment history of allocated family members			
	Maintain communication & follow up of remedial measures	By the end of this visit, students should be able to provide details of communication maintained with family members for follow-up of treatment, and suggested remedial measures along with details of vaccination drive	Reporting of follow up visits, PRA techniques (transact walk, group discussion) Community clinics,	Community case presentation, OSPE, logbook based certification of competency, journal of visit	3hrs
	- Take part in environment protection and sustenance activities. - Council the family members of allotted families and analyze the health trajectory of adopted family under overall guidance of mentor	By the end of this visit, students should be able to report the activities undertaken for environment protection and sustenance like study of environment of families, tree plantation herbal plantation activities conducted in the village. By the end of this visit, students should be able to analyze and report the health trajectory of adopted family along with remedial measures adopted at individual, family and community level	Participation in and Process documentation of activities (NSS activities) along with reporting of photographic evidences, Small group discussion (report of the health trajectory of adopted family)	logbook based certification of competency, journal of visit	3hrs
					(total 21 hrs. 7 visits)

LOG BOOK FOR FAMILY ADOPTION

COLLEGE NAME :

UNIVERSITY :

ADDRESS DETAILS :

NAME OF THE STUDENT :

ROLL NO. :

VILLAGE NAME :

TEHSIL/ DISTRICT :

STATE/ UNION TERRITORY :

NAME OF THE MENTOR :

MENTOR STATUS :

Asst. Prof/ S.R. And Details

(If changed, details of subsequent
mentors)

NAME OF ASHA WORKER :

ADDRESS OF ASHA WORKER :

EXPERIENCE :

(SINCE HOW MANY YEARS IS HE/ SHE EMPLOYED)

(SEPARATE PAGE FOR EACH FAMILY BE MAINTAINED)

- Family name and address
- Approximate size of living space of house-hold
- Malaria/ flu/ etc pertinent to the region

- 1) If there is any illness or medical emergency required by the house-hold, the student should take initiative in being the primary contact for the family.
- 2) The student in turn should consult his/her mentor for further management of the patient.
- 3) The hospital to which the college is attached must provide treatment facilities to the patient.
- 4) Government schemes may be utilized for optimal management.
- 5) Follow-up records must be maintained by the student. These must be periodically evaluated by mentors with the help of senior residents.
- 6) The entire data sheet may be prepared by every student and submitted by the end of 6th semester for evaluation.
- 7) Progress notes must include every demographic point and history recorded.



**GUIDELINES FOR MANPOWER REQUIREMENT FOR RESEARCH FACILITIES
IN A MEDICAL COLLEGE**

Research labs can be under following categories:

1. Molecular lab
2. Stem cell research lab
3. Cytogenetics
4. HLA and tissue typing research lab

Applied Clinical research for organ perfusion, cancer research, in vitro fertilization, etc. can be under any of the above research facilities.

MAN POWER

(1) Lab Director post-1

Minimum Qualifications required :	MD Path/MD Microbiology/MD Transfusion Medicine/MD Biochemistry. Faculty with PhD (Medical subject will be preferred)
Lab work :	10 years experience
Lab research related publications :	Minimum 10 in last 10 years

(2) Lab Supervisor post-1 (per research facility)

Minimum Qualifications required :	MD Path/ MD Microbiology/ MD Transfusion Medicine/ MD Biochemistry Faculty with PhD (Medical subject) will be preferred or MSc in life sciences with Ph.D. from Medical college
Lab work :	7 years experience
Lab research related publications :	Minimum 5 in last 5 years

(3) Senior Scientific Research Officer posts- 1 or more (per research facility)

Minimum Qualifications required : PhD with MD Path/ MD Microbiology/
MD Transfusion Medicine/ MD
Biochemistry/PhD in medical college or
MSc in life sciences with PhD from
medical college

Lab work : 4years experience

Lab research related publications : Minimum 3 in last 3 years

(4) Junior Research Officer-posts- 1 or more (per research facility)

Minimum Qualifications required : MD Path/ MD Microbiology/ MD
Transfusion Medicine/ MD Biochemistry
or Diploma in Clinical Pathology/ MSc
in life sciences, PhD scholar/ Postdoc
fellow

Diploma holder in any branch may
pursue PhD if experience / research
inclinations proved for minimum of 1
year. They can be enrolled for integrated
Master's PhD course.

Lab work : 1 year experience

Lab research related publications : Preferably 1 in last 2 years

(5) Laboratory Technicians- Posts- 2 (minimum)

Minimum Qualifications required : B.Sc/ M.Sc, in life sciences including
Biotechnology,
DMLT

(6) Data entry operator/ Clerk – (As per requirement)

(7) Store keeper – post 1 (minimum)

-8-

(8) Biostatistician- post 1(minimum)

(9) Lab attendant (As per requirement)

(10) Peon/ Multi-task worker (As per requirement)

(11) Clinical Monitors (As per requirement)

Minimum Qualifications required : A medical professional having MBBS degree or above with research inclination

(12) Social worker/ MSW with applied research inclinations (As per requirement)

Guidelines regarding admission of students with "Specified Disabilities" under the Rights of Persons with Disabilities Act, 2016 with respect to admission in MBBS Course.

- Note : 1. The "Certificate of Disability" shall be issued in accordance with the Rights of Persons with Disabilities Rules, 2017 notified in the Gazette of India by the Ministry of Social Justice and Empowerment [Department of Empowerment of Persons with Disabilities (*Divyangjan*)] on 15th June 2017.
2. The extent of "specified disability" in a person shall be assessed in accordance with the "Guidelines for the purpose of assessing the extent of specified disability in a person included under the Rights of Persons with Disabilities Act, 2016 (49 of 2016)" notified in the Gazette of India by the Ministry of Social Justice and Empowerment [Department of Empowerment of Persons with Disabilities (*Divyangjan*)] on 4th January 2018.
3. The minimum degree of disability should be 40% (Benchmark Disability) in order to be eligible for availing reservation for persons with specified disability.
4. **The term 'Persons with Disabilities' (PwD) is to be used instead of the term 'Physically Handicapped' (PH).**

S. No.	Disability Type	Type of Disabilities	Specified Disability	Disability Range		
				Eligible for Medical Course, Not Eligible for PwD Quota	Eligible for Medical Course, Eligible for PwD Quota	Not Eligible for Medical Course
1.	Physical Disability	A. Locomotor Disability, including Specified Disabilities(a to f).	a. Leprosy cured person*	Less than 40% disability	40-80% disability Persons with more than 80% disability may also be allowed on case to case basis and their functional competency will be determined with the aid of assistive devices, if it is being used, to see if it is brought below 80% and whether they possess sufficient motor ability as required to pursue and complete the course satisfactorily.	More than 80%
			b. Cerebral Palsy**			
			c. Dwarfism			
			d. Muscular Dystrophy			
			e. Acid attack victims			
			f. Others*** such as Amputation, Poliomyelitis, etc.			
		* Attention should be paid to loss of sensations in fingers and hands, amputation, as well as involvement of eyes and corresponding recommendations be looked at. ** Attention should be paid to impairment of vision, hearing, cognitive function etc. and corresponding recommendations be looked at. *** (i) Both hands intact, with intact sensations, sufficient strength and range of motion are essential to be considered eligible for medical course. (ii) Movement of the upper limb with respect to all the joints (shoulder, elbow, forearm, wrist and all fingers) to be considered - full power, intact, in the dominant upper limb is necessary. (iii) For non-dominant upper limb, power of 4/5 or above is recommended.				
		B. Visual Impairment (*)	a. Blindness	Less than 40% disability	-	Equal to or More than 40% Disability
			b. Low vision			
		C. Hearing impairment@	a. Deaf	Less than 40% Disability	-	Equal to or more than 40% Disability
			b. Hard of hearing			
		(*) Persons with Visual impairment / visual disability of equal to or more than 40% may be made eligible to pursue MBBS Course and may be given reservation, subject to the condition that the visual disability is brought to a level of less than the benchmark of 40% with advanced low vision aids such as telescopes / magnifier etc. @Person with hearing disability of more than 40% may be made eligible to pursue MBBS Course and may be given reservation subject to condition that the hearing disability is brought to a level of less than the bench mark of 40% with the aid of assistive devices/cochlear implants (CI). In addition to this, the individual should have speech discrimination score of more than 60%				

		Type of Disabilities	Disability Range			
			Specified Disability	Eligible for Medical Course, Not Eligible for PwD Quota	Eligible for Medical Course, Eligible for PwD Quota	Not Eligible for Medical Course
		D. Speech & language disability\$	Organic/neurological causes	Less than 40% Disability	-	Equal to or more than 40% Disability
		\$ Persons with Speech Intelligibility Affected (SIA) shall be eligible to pursue MBBS Courses, provided Speech Intelligibility Affected (SIA) score shall not exceed 3 (three), which is 40% or below. Persons with Aphasia shall be eligible to pursue MBBS Courses, provided Aphasia Quotient (AQ) is 40% or below.				
2.	Intellectual disability	a. Specific learning disabilities (Perceptual disabilities, Dyslexia, Dyscalculia, Dyspraxia & Developmental aphasia)#	# currently there is no Quantification scale available to assess the severity of SLD, therefore the cut-off of 40% is arbitrary and more evidence is needed.			
				Less than 40% Disability	Equal to or more than 40% disability and equal to or less than 80%. But selection will be based on the learning competency evaluated with the help of the remediation/assisted technology/aids/infrastructural changes by the Expert Panel. According to the Notification dated 09.12.2020 by the Department of Empowerment of Persons with Disabilities (Divyangjan), Ministry of Social Justice, diagnosis of SLD using NIMHANS SLD Battery should be equated to more than 40% disability. Any person with SLD and more than 40% disability should be allowed to complete at par with other PwDs under the reservation quota for PwDs.	More than 80% or severe nature or significant cognitive/intellectual disability.
		b. Autism spectrum disorders		Absence or Mild Disability, Asperger syndrome (disability of upto 60% as per ISAA) where the individual is fit for MBBS course by an expert panel.	Currently not recommended due to lack of objective method to establish presence and extent of mental illness. However, the benefit of reservation/quota may be considered in future after developing better methods of disability assessment.	More than 60% disability or presence of cognitive/intellectual disability and/or if the person is unfit for pursuing MBBS course by an expert panel.
3.	Mental Behavior	*** Mental Illness	Mental Illness will be no bar for taking admission in MBBS Course provided the candidate is able to qualify the NEET UG. <i>However, the benefit of reservation/quota may be considered in future after developing better methods of disability assessment.</i>			
4.	Disability caused due to	a. Chronic Neurological Conditions	i. Multiple Sclerosis	Less than 40% Disability	40-80% disability	More than 80%
			ii. Parkinsonism			
		b. Blood Disorders	i. Hemophilia	Less than 40% Disability	40-80% disability	More than 80%
			ii. Thalassemia			
			iii. Sickle cell disease			

S. No.	Disability Type	Type of Disabilities	Specified Disability	Disability Range		
				Eligible for Medical Course, Not Eligible for PwD Quota	Eligible for Medical Course, Eligible for PwD Quota	Not Eligible for Medical Course
5.	Multiple disabilities including deaf		More than one of the above specified disabilities	Must consider all above while deciding in individual cases recommendations with respect to presence any of the above, namely, Visual, Hearing, Speech & Language disability, Intellectual Disability, and Mental Illness as a component of Multiple Disability. Combining Formula as notified by the related Gazette Notification issued by the Govt. of India $\frac{a + b(90-a)}{90}$ (where a= higher value of disability % and b=lower value of disability % as calculated for different disabilities) is recommended for computing the disability arising when more than one disabling condition is present in a given individual. This formula may be used in cases with multiple disabilities, and recommendations regarding admission and/or reservation made as per the specific disabilities present in a given individual		

*** That by virtue of the order dated 18.05.2023 passed by the Hon'ble Supreme Court of India in WP (C) No. 1093 of 2023 titled Vishal Gupta Vs UOI & Ors., the Under Graduate Medical Education Board, an autonomous board under National Medical Commission, constituted an expert committee. Accordingly on 14th July, 2023, the expert meeting was held and the issues related to the review of guidelines specifically with respect to Specific learning disabilities (SLD), Autism spectrum disorders (ASD) and Mental Illness, were discussed in detail. Thereafter recommendations based on the discussions held in the meeting were received in the commission and such recommendations were considered by the UGMEB.



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राष्ट्रीय आयुर्विज्ञान आयोग
National Medical Commission
Academic Cell

No. - D-11011/747/2023/Circular/Academic Cell

New Delhi, dated the 10th Aug. 2023

CIRCULAR

Subject : Composition of Medical Education Unit (MEU) and Curriculum Committee- reg.

It has been observed that many Medical colleges have resorted to keeping the same faculty in their Medical Education Unit (MEU) and in Curriculum Committee (CC). This defies the guidelines on the matter and the purpose of faculty development programs. All the colleges/Institutes/Nodal Centres/Regional Centres are informed that :

- (i) The Curriculum Committee (CC) is to ensure implementation and monitoring of curriculum at their colleges, Conduct of CISP, Time table scheduling etc. whereas the Medical Education Unit (MEU) is to focus on training support, Conduct of BCME and other in-house training of faculty.
- (ii) The only common member/ appointment permitted in both MEU and CC are Dean/Principal and Convener / MEU Coordinator.
- (iii) All Medical colleges are instructed to strictly follow guidelines on constitution of MEU and CC issued vide Circular No. D 11011/343/2023/Academic cell dated 22nd Mar 2023. Conveners of Nodal centres and Regional centres are requested to ensure this amongst their allocated colleges.
- (iv) Till the above is rectified, no permissions for BCME/ CISP III shall be issued by Academic cell, UGMEB. However an exemption to above, for a period of 1 year (till 31st Jul 2024), is granted to those medical colleges that are established in 2019 or later. Such colleges are also advised to make up their MEU and CC as per guidelines at the earliest.
- (v) Keeping in view the large number of faculty in medical colleges that has to undergo FDP, it is clarified that upto 25% of training sessions of BCME and CISP III may be taken by faculty from MEU and CC mutually. This is only an interim measure till 31st Jan 2024.


(Shambhu Sharan Kumar)
Director, UGMEB

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राष्ट्रीय आयुर्विज्ञान आयोग
National Medical Commission
(Undergraduate Medical Education Board)

F. No. U/14021/8/2023-UGMEB
2023

Dated the 1st September,

CORRIGENDUM

**Subject :Competency Based Medical Education Curriculum (CBME) Guidelines-
National Medical Commission.**

Kindly refer to the communication of even no. dated 01st August, 2023 on the above mentioned subject and to inform that provisions at page 58 of CBME is amended as under :

Page 58 of CBME Guidelines	Amended page 58 of CBME Guidelines
In subjects that have two papers, the learner must secure minimum 50% of marks in aggregate (both papers together) to pass in the said subject.	In subjects that have two papers, the learner must secure minimum 40% of marks in aggregate (both papers together) to pass in the said subject.
Criteria for passing in a subject : A candidate shall obtain 50% marks in University conducted examination separately in Theory and in Practical (practical includes; practical/clinical and viva voce) in order to be declared as passed in that subject.	Criteria for passing in a subject : A candidate shall obtain 50% marks in aggregate and 60:40 (minimum) or 40:60 (minimum) in University conducted examination separately in Theory and in Practical (practical includes; practical/clinical and viva voce) in order to be declared as passed in that subject.


01/9/2023
(Shambhu Sharan Kumar)
Director, UGMEB

FREQUENTLY ASKED QUESTIONS RELATED TO CBME COURSE CURRICULUM

Disclaimer: These FAQs are in the nature of explanation for ease of understanding of the general public and cannot be upheld in a court of law. Please refer to the relevant Guidelines for legal validity.

Q1. Since when will these guidelines be applicable?

These guidelines are applicable since the date of publication i.e. from 1st August, 2023.

Q2. To whom are these guidelines applicable?

These guidelines are applicable for all stake holders, i.e. for every student of every batch admitted to MBBS course since 2019, presently pursuing MBBS course in a medical college/institution which is under the jurisdiction of NMC.

Q3. Whether a student can appear in the supplementary examination, if the attendance is inadequate at the time of annual examination?

No, if the student's attendance is less than 75% for theory and less than 80% for practical/ clinical training, the student cannot appear in supplementary examination following the regular annual examination. Such student is required to take classes with junior batch commencing in the next academic year to compensate for his attendance deficit, especially the course, he has missed. He will be eligible to appear in the examination in the next academic year only.

However, before the commencement of annual examination, the college authorities may arrange for additional classes to compensate for attendance deficit. It shall be at the discretion and purview of the college authorities to arrange for making up deficiencies.

Q4. Can a student be allowed to join the classes of the next academic year after appearing for the annual examination?

For 1st MBBS examination: Second MBBS classes/ clinical or practical training shall not start till the results of 1st MBBS are declared. Student shall only be allowed to join 2nd MBBS if he has successfully passed in all subjects in annual/ supplementary examination of 1st MBBS.

For 2nd MBBS: A candidate, who fails in the second Professional examination, shall be allowed to join the third Professional Part I training, however he shall not be allowed to appear for the examination unless he has passed second professional examination.

For Final MBBS: A candidate who fails in the third Professional (Part I) examination shall be allowed to join third Professional part II training, however he shall not be allowed to appear for the final examination/NExT unless he has passed final first professional examination.

Q6. What is the total course duration permitted for MBBS training?

Every student is required to undergo a minimum period of study extending over 4 ½ academic years, divided into four professional years from the date of commencement of course to the date of completion of examination which shall be followed by one year of compulsory rotating medical internship.

The maximum total duration of MBBS course permitted to complete the MBBS course, is ten (10) years including the period of Compulsory Rotating Medical Internship (CRMI).

Maximum permitted duration for completion of Internship is 2 years. This is applicable for all MBBS students admitted in 2019 and thereafter.

Q7. How are the 4 attempts/4 years counted for first year MBBS students?

No student shall be allowed more than four (04) attempts for first year (First Professional MBBS). In these four years, the maximum number of attempts permitted shall be four (4) which include supplementary examination also.

Q8. What if a candidate fails complete MBBS Course or mandatory Internship (CRMI) within a stipulated time limit?

If a candidate fails to qualify/complete the course / internship in prescribed time limit, he shall not be allowed to continue the MBBS Course under any circumstances.

Q9. How many marks have to be allotted for MCQ in the annual examination?

The maximum marks to be allotted for MCQ in the annual examination shall be 20. It shall be at the discretion of the University to work out the details.

Q10. What will be the marks required for theory examination for passing in the annual examination if there are two papers for a given subject?

The aggregate or sum-total of theory and practicals for a given subject shall be at least 50% to declare a student as having successfully cleared a subject, i.e. passed in a subject. However, the minimum score in theory/ practical examination shall be at least 40% of the allotted marks.

E.g., if the maximum allotted marks are 100, the student shall have to score at least 40 marks out of 100. When there are two papers of 100 marks each, the sum total of two

papers shall be 40%, which means that a student has to score a sum-total of 80 marks in both papers out of 200, to be declared as having passed in the subject; provided he scores at least 60% in practical examination. Vice versa shall also be applicable.

Q11. Will there be any grace marks in university examination?

There shall be no grace marks in the university examination.

Q12. How many examiners shall be required to be appointed for annual examination?

Each student shall be examined by a set of four examiners, 2 internal and 2 external. Thus even if a supplementary examination is to be conducted for small number of students, 4 examiners are mandatorily required for the student's evaluation/ performance.

Q13. Do the external examiners have to be from outside the university or can they be appointed even if they are from the same university?

Any faculty who is not from the college where the students are to be examined, shall be treated as external, even if he is from the same university. However, if possible, examiners from outside the university and preferably from outside the state may be appointed as external examiners. This shall widen the horizons of students and examiners and students across the whole country shall be evaluated more equitably.

Q14. Whether the non-medico faculty members (without MBBS/MD/MS Qualifications) can be appointed as examiners?

No. Only MBBS faculty with required qualifications mentioned in guidelines shall be eligible to be appointed as examiners for UG examination at all stages, i.e. both internal examination and final university examinations.

Q15. From which batch is the family adoption program mandatory?

Family adoption program through village outreach is mandatory from MBBS batch admitted in the year 2023-24. Those batches who have introduced FAP shall assess the students as per the assessment module displayed on the website. It is mandatory for all colleges to follow the guidelines mentioned in family adoption program.

Q16. Whether a student can take transfer/migration from one medical college to another medical college?

No student once designated to a Medical Institution shall be allowed to seek transfer/migration to any other Medical Institution under any circumstances.

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राष्ट्रीय आयुर्विज्ञान आयोग
National Medical Commission
Under Graduate Medical Education Board

No.U/14021/8/2023-UGMEB

Dated : 3rd October, 2023

PUBLIC NOTICE

This is in continuation to new Amendment in CBME Guidelines issued through "Corrigendum" bearing No.F.No.U/14021/8/2023-UGMEB dated 01.09.2023 where a new amendment was introduced to the CBME Guidelines vide page number -58.

2. After thorough consideration of the subject matter, it has been decided that retrospective effect in this connection is not possible.


 3/10/2023
 (Shambhu Sharan Kumar)
 Director(UGMEB)

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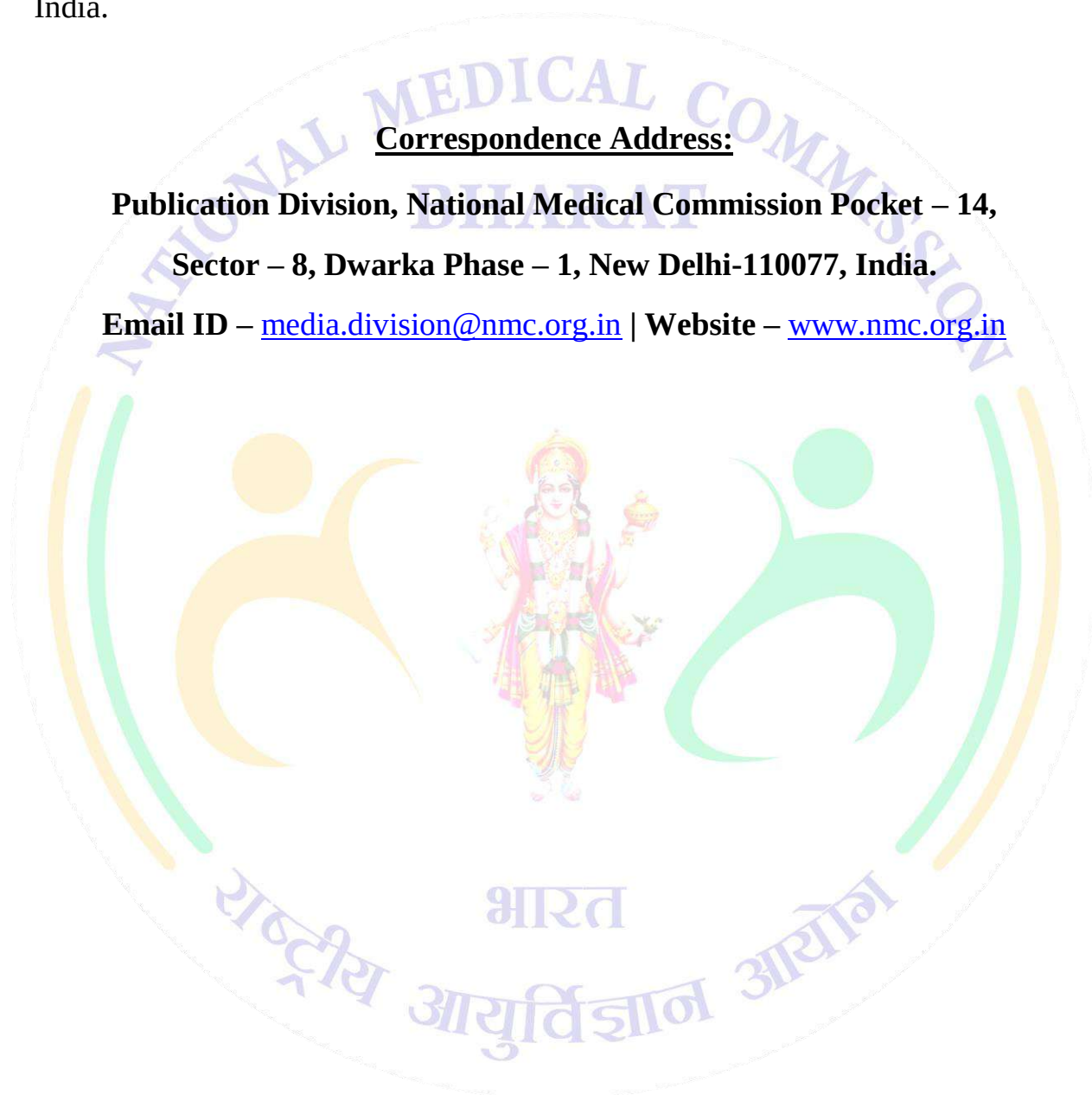
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The National Medical Commission (NMC) is India's premier regulatory body overseeing medical education and practice. Committed to upholding the highest standards in healthcare education, NMC ensures the delivery of quality medical education and training across the nation.

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