



MAHATMA GANDHI UNIVERSITY
of
MEDICAL SCIENCES & TECHNOLOGY
JAIPUR

Super Specialty Courses


SYLLABUS
DM - HEPATOLOGY (DM12)

NO CHANGE FOR 2023 24

Principal & Controller
Mahatma Gandhi Medical College & Hospital
Sitapura, JAIPUR

Edition 2022-23

DM-HEPATOLOGY


Dr. VIVEKA, BARASWAT, MD, DM
Professor & Head
Dept. of Hepatology, Pancreatobiliary Sciences
& Liver Transplant)
MCI No.1095

Dr. Vivek Arund
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Notice

1. Amendment made by the National Medical Commission (NMC) in Rules/Regulations of Post Graduate Medical Courses shall automatically apply to the Rules/Regulations of the Mahatma Gandhi University of Medical Sciences & Technology (MGUMST), Jaipur.
2. The University reserves the right to make changes in the syllabus/books/guidelines, fees-structure or any other information at any time without prior notice. The decision of the University shall be binding on all.
3. The Jurisdiction of all court cases shall be Jaipur Bench of Hon'ble Rajasthan High Court only.



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Syllabus of DM / M.Ch. Courses

DM IN HEPATOLOGY (DM12)

SELECTION OF CANDIDATES:

There shall be a uniform entrance examination to all medical educational institutions at the Postgraduate level namely 'National Eligibility-cum-Entrance Test' for admission to postgraduate courses in each academic year and shall be conducted under the overall supervision of the Ministry of Health & Family Welfare, Government of India.

In order to be eligible for admission to Postgraduate Course for an academic year, it shall be necessary for a candidate to obtain minimum of marks at 50th percentile in the 'National Eligibility-Cum-Entrance Test for Postgraduate courses' held for the said academic year. However, in respect of candidates belonging to Scheduled Castes, Scheduled Tribes, and Other Backward Classes, the minimum marks shall be at 40th percentile. In respect of candidates with benchmark disabilities specified under the Rights of Persons with Disabilities Act, 2016, the minimum marks shall be at 45th percentile for General Category and 40th percentile for SC/ST/OBC.

The percentile shall be determined on the basis of highest marks secured in the All India Common merit list in National Eligibility-cum-Entrance Test for Postgraduate courses.

Provided when sufficient number of candidates in the respective categories fail to secure minimum marks as prescribed in National Eligibility-cum-Entrance Test held for any academic year for admission to Postgraduate Courses, the Central Government in consultation with Medical Council of India may at its discretion lower the minimum marks required for admission to Post Graduate Course for candidates belonging to respective categories and marks so lowered by the Central Government shall be applicable for the academic year only.

The reservation of seats in Medical Colleges/institutions for respective categories shall be as per applicable laws prevailing in States/Union Territories. An all India merit list as well as State-wise merit list of the eligible candidates shall be prepared on the basis of the marks obtained in National Eligibility-cum-Entrance Test and candidates shall be admitted to Postgraduate Courses from the said merit lists only.

There shall be no admission of students in respect of any academic session beyond 31st August under any circumstances. The Universities shall not register any student admitted beyond the said date.

ELIGIBILITY:

Candidates must meet the eligibility criteria required to get admission to DM courses through NEET-SS.

Common Counseling:

There shall be a common counseling for admission to all Postgraduate Super specialty Courses (DM/ M.Ch.) in all Medical Educational Institutions on the basis of merit list of the National Eligibility-cum-Entrance Test.

Period of Training:

The period of training for obtaining DM/M.Ch Degrees shall be three completed years including the examination period.

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Migration:

Under no circumstance, Migration/transfer of student undergoing any Super Specialty course shall be permitted by any University/ Authority.

Staff - Faculty:

Only those teachers who possess 6 years teaching experience out of which at least 2 years teaching experience as Assistant Professor gained after obtaining the higher specialty degree shall be recognized post graduate teacher.

No teacher shall be considered as a postgraduate teacher in any other institution during the period till the postgraduate course at the institute which has been granted permission considering him as a postgraduate teacher is recognized u/s 11(2) of the Indian Medical Council Act, 1956.

Minimum staff required (Super-speciality):

- 1- Professor
- 1- Associate Professor
- 1- Assistant Professor
- 1- Senior Resident
- 2- Junior Resident

Training Programme:

All the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80% (Eighty percent) of the imparted training during each academic year (Academic Term of 6 months) including assignments, assessed full time responsibilities and participation in all facets of the educational process.

No candidate shall be permitted to run a clinic/work in clinic/laboratory/nursing home while studying postgraduate super specialty course. No candidate shall join any other course or appear for any other examination conducted by this university or any other university in India or abroad during the period of registration.

Every institution undertaking Post Graduate training programme shall set up an Academic cell or a curriculum committee, under the chairmanship of a senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other department faculty staff and also coordinate and monitor the implementation of these training Programmes.

The training programmes shall be updated as and when required. The structured training programme shall be written up and strictly followed, to enable the examiners to determine the training undergone by the candidates and the Medical Council of India inspectors to assess the same at the time of inspection.

Post Graduate students shall maintain a record (log) book of the work carried out by them and the training programme undergone during the period of training including details of surgical operations assisted or done independently by M.Ch. candidates.

The Record (Log) Books shall be checked and assessed periodically by the faculty members imparting the training.

During the training for award of Degree / Superspecialty in clinical disciplines, there shall be proper

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training in Basic medical sciences related to the disciplines concerned; so also in the applied aspects of the subject; and allied subjects related to the disciplines concerned. In the Post Graduate training programmes including both Clinical and Basic medical sciences, emphasis has to be laid on Preventive and Social aspects. Emergency care, facilities for Autopsies, Biopsies, Cytopsies, Endoscopy and Imaging etc. shall also be made available for training purposes.

The Post Graduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.

Training in Medical Audit, Management, Health Economics, Health Information System, basics of statistics, exposure to human behaviour studies, knowledge of pharmaco – economics and introduction to nonlinear mathematics shall be imparted to the Post Graduate students.

The teaching and training of the students shall include graded responsibility in the management and treatment of patients entrusted to their care; participation in Seminars, Journal Clubs, Group Discussions, Clinical Meetings, Grand Rounds, and Clinico-Pathological Conferences; practical training in Diagnosis and Medical and Surgical treatment; training in the Basic Medical Sciences, as well as in allied clinical specialities.

The training programme shall be on the same pattern as for M.D. / M.S. in clinical disciplines; with practical training including advanced Diagnostic, Therapeutic and Laboratory techniques, relevant to the subject of specialization. Postgraduate Superspecialty Residents in Surgical Specialties shall participate in Surgical operations as well.

A postgraduate student of a postgraduate degree course in 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.

ENROLMENT AND REGISTRATION:

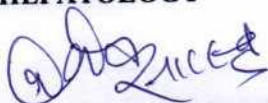
Every candidate who is admitted to DM/MCh. course in Mahatma Gandhi Medical College & Hospital shall be required to get himself/herself enrolled and registered with the Mahatma Gandhi University of Medical Sciences & Technology (MGUMST) after paying the prescribed eligibility and enrolment fees.

The candidate shall have to submit an application to the MGUMST through Principal of College for the enrolment/eligibility along with the following original documents and the prescribed fees within two months of the last date of admission to the respective program without late fees. Then after, students will have to pay applicable late fees as per prevailing University Rules.

- (a) MD/MS pass Marks sheet/Degree certificate issued by the University.
- (b) Migration certificate issued by the concerned University (in case the University is other than the MGUMST).
- (c) Date of Birth Certificate
- (d) Certificate regarding registration with Rajasthan Medical Council / Medical Council of India / Other State Medical Council.

No candidate shall be allowed to appear in University examination without his/her enrolment with the University

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SCHEME OF EXAMINATIONS:

The examination shall be held at the end of three academic years (six academic terms). The academic term shall mean six months training period. The examination shall consist of: Theory and Clinical/Practical and Oral.

The examinations shall be organised on the basis of 'Marking system' to evaluate and to certify candidate's level of knowledge, skill and competence.

For passing DM/M.Ch. examination as a whole, a candidate shall secure not less than 50% marks in each head of passing which shall include (1) Theory (2) Clinical / Practical and Oral examination.

(1) Theory:

There shall be four theory papers of 3 hours duration and 100 marks each. 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 and Oral examination.

Paper I and II will be set by one external examiner from outside of the state and paper III and IV by another external examiner from outside of the state. The external examiner, who is paper setter for paper I & II shall evaluate the answer books of paper II. The external examiner, who is paper setter for paper III & IV shall evaluate the answer books of paper III. The answer books of paper I & IV shall be evaluated by internal examiners. The answer books of paper IV shall be evaluated by the Head of the Department and the answer books of paper I shall be evaluated by the second Internal Examiner.

Candidates will be required to attempt all the questions in every question paper. In Paper I, Paper II and Paper III there will be 10 questions. Each question shall carry 10 marks. In Paper IV there will be 5 questions of 20 marks each.

Obtaining a minimum of 40% marks in each theory paper and not less than 50% cumulatively in all the four papers shall be compulsory to pass the examination.

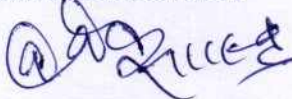
The paper wise distribution of the Theory Examination shall be as follows:

Paper I:	Basic Sciences of Hepatology
Paper II:	Clinical Hepatology
Paper III:	Transplant Hepatology
Paper IV:	Advances in Hepatology

(2) Clinical / Practical and Oral:

Clinical/Practical examination shall be conducted to test / aimed at assessing the knowledge and competence of the candidate for undertaking independent work as a specialist / teacher. Practical examination shall consist of carrying out special investigative techniques for Diagnosis and Therapy. Candidates shall also be examined in surgical procedures. Oral examination may be comprehensive enough to test the candidate's overall knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty, which shall form a part of the examination.

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Obtaining of 50% marks in Clinical / Practical and Oral examination shall be mandatory for passing the Clinical / Practical and Oral examination-

Maximum Marks: 400.

Result:

For passing DM/M.Ch. Examination, a candidate will be required to obtain at least 40% marks in each theory paper, 50% marks in the aggregate of all the four theory papers and 50% marks in the aggregate of Clinical / Practical and Oral examination separately. A candidate failing in any theory paper or in the aggregate of all four theory papers or Clinical / Practical and Oral examination shall have to repeat the whole DM/M.Ch. examination.

Grace Marks:

No grace marks will be provided in DM/M.Ch. examinations.

Revaluation / Scrutiny:

No Revaluation shall be permitted in the DM/M.Ch. examinations. However, the student can apply for scrutiny of the answer books as per University Rules

Examiners:

As per the Amendment Notification of the MCI dated June 5, 2017, no person shall be appointed as an internal examiner in any subject unless he/she has three years experience as recognized PG teacher in the concerned subject. For external examiners, he/she should have minimum six years of experience as recognized PG teacher in the concerned subject.

For all Post Graduate Super specialties examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners, who shall be invited from other recognised universities from outside the State.


Number of Candidates:

The maximum number of candidates to be examined in Clinical / Practical and Oral on any day shall not exceed three for D.M./M.Ch. Examinations.

Number of Examinations:

The university shall conduct not more than two examinations in a year, for any subject, with an interval of not less than 4 and not more than 6 months between the two examinations.

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GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR DM IN HEPATOLOGY

Preamble

Hepatobiliary disorders are a major cause of morbidity and mortality among Indians. Such patients need specialized diagnostic skills, laboratory evaluation and management strategies. These disorders have genetic, familial, metabolic, infective, neoplastic immune-mediated and environmental origin. Spectrum of liver diseases is very wide and variable. Liver diseases are difficult to manage, have complicated course and poor outcomes. There is need of separate specialists and experts devoted to management of liver diseases. Moreover with new investigations, therapeutic interventions, newer drugs and techniques, approach to patients with liver diseases have become an independent, time consuming process. Therefore, Hepatology assumes importance as a dedicated specialty to generate skilled manpower to widen the scope of better patient care in India.

Some of the important highlights are:

- 1) An in-depth understanding of the dynamic events in hepatobiliary system occurring during life and the importance of these physiologic variables that occur during liver development and growth.
- 2) Recognition of the unique nature of inherited and acquired liver diseases that affect people in India.
- 3) Liver transplantation has become a standard modality of management for patients with liver failure with excellent outcome. Training of physicians in specialized hepatology care would improve preoperative, peri-operative, postoperative and long-term care of liver transplantation and also timely referrals.
- 4) Application of technology has taken a big leap in terms of endoscopic and radiologic interventions and also usage of serological, molecular and metabolic investigations benefit diagnosis and therapy.
- 5) Trained manpower in this super specialty will pave the way of dedicated research that can be applied for understanding pathophysiological aspects, treatment and

development of innovations matching global levels to alleviate illness in people of India. There is growing evidence in world literature that a number of hepatobiliary disorders which manifest during adulthood need a specialized approach and expertise in field of Hepatology. Thus to unravel linkages development of trained hepatologists is the need of present time.

- 6) Trained manpower of this superspecialty will set up solutions to multiple interventions at population level in India.
- 7) A number of unique disorders like extrahepatic portal venous obstruction, Budd-Chari syndrome, and unidentified causes of cirrhosis and also increasing evidence of obesity affecting liver as well as non-alcoholic fatty liver disease (NASLD) and non-alcoholic steatohepatitis (NASH) are prevalent in developing countries like ours. Super-specialty development will make a dent to explore new pathways of solutions.

SUBJECT SPECIFIC OBJECTIVES

Theoretical Knowledge: The primary goal of the program is to train academically oriented hepatologists. Academic hepatologists should be excellent clinicians encompassing highest levels of skills in evaluation, diagnosis and management of primary and secondary disorders of the hepatobiliary system. They should be active in advancing the field by participating in research and capable enough to impart training/ education.

Practical and Clinical skills: The program is devoted principally to clinical training, with both inpatient and outpatient activities and participation in an active consultation service including emergency and intensive care management. Postgraduates should obtain excellence in clinical, intensive care, transplant hepatology, diagnostic and therapeutic endoscopy, various procedures and laboratory evaluation-cum interpretation in patients with liver diseases.

Writing Research articles: The candidate should complete two research projects duly cleared by Ethics Committee. Both the research projects should either be published/accepted for publication as original articles in indexed journals or approved as certified by two external reviewers before appearing for final theory exit examination.

Attitudes including communication skills: Communication skills with the patients are paramount and trainees are expected to master this during their training period. Regular clinical rounds and academic presentations in the teaching programs should help the trainees to develop

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scientific communicative skills. With round the year presentations in the teaching programs the trainee should develop communicative and research skills. Trainees should be encouraged to review liver disease data and present at various conferences.

Training in Research Methodology: In-house research methodology training should be provided for the trainees from time to time. They should attend workshops/ courses outside the working institution. Importantly courses in biostatistics and ethics should be mandatory.

SUBJECT SPECIFIC COMPETENCIES

At the end of the course, the student should be able to acquire the following competencies under the three domains:

Cognitive domain (Knowledge domain)


By the end of the course the DM candidate

- should be encompassing skills in broad aspects of evaluation, diagnosis and management of primary and secondary diseases of the hepatobiliary system and pancreas
- should develop ability in advancing the field by participating in research
- should be competent enough to impart training and education.

Affective domain (Attitudes including Communication and Professionalism)

The DM candidate

- should become confident communicators and should be well accomplished professionals.
- should be ready to deliver the knowledge received by them during the course.
- should have developed skills to debate, deliver scientific lecture, participate in panel discussions, and hold group discussions.
- should 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.



- 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.
- 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.

Psychomotor Domain (subject specific practice based or practical competencies)

The DM candidate

- should be able to take independent management decisions
- should carry out the endoscopic procedures, liver biopsy procedures, paracentesis, hemodynamic studies and handle emergencies with utmost confidence.
- interpretation of laboratory tests
- analyses and evaluation of findings of various procedures

The student should be able to perform independently the following procedures:

1. UGI and lower GI Endoscopy, both diagnostic and therapeutic
 - Endoscopic sclerotherapy
 - Endoscopic variceal band ligation
 - Other haemostatic procedures
 - Endoscopic biopsies
 - Endoscopic stricture dilatation
 - Endoscopic argon plasma coagulation
 - Endoscopic stent placement

The student should become familiar with the following procedures:

1. Side viewing Endoscopy (ERCP), biliary stenting, NBD drainage, papillotomy and stone extraction
2. Endosonography
3. Doppler studies and Ultrasound of liver and biliary tract
4. Invasive hemodynamics

5. Liver biopsies
 - Percutaneous and transjugular liver biopsy procedure
6. Intensive care management of liver patients
 - Subclavian and transjugular catheterization
 - Ventilatory care
7. Pre - and post - liver transplantation along with long-term follow-up

Syllabus

Course contents:

The student should acquire knowledge in the following areas:

- Development of hepatobiliary system
- Hepatobiliary system: structural, functional and pathophysiological aspects
- Liver in health and disease: metabolic, molecular, functional and structural effects
- Liver failure
- Congenital structural defects
- Metabolic liver diseases
- Acute liver failure
- Chronic liver disease
- Cholestatic liver disease
- Autoimmune liver disease
- Drug induced liver injury
- Acute and Chronic viral hepatitis
- Liver infections
- Vascular diseases of liver
- Non- alcoholic fatty liver disease
- Hepatobiliary tumors
- Hepatobiliary disorders in systemic disease
- Hepatobiliary disorders and other organ- specific manifestations and vice versa.
- Liver and drug metabolism in normal and disease states.



- Immunological liver diseases
- Portal hypertension
- Tropical liver diseases
- Gut-liver, liver-brain and liver-heart axis
- Gall bladder disorders
- Liver transplantation: medical and surgical aspects
- Gut and liver in health and disease.
- Biliary tract and pancreas in various disease states.
- Radiological aspects
- Endoscopic procedures
- Surgical aspects
- Preventive hepatology

TEACHING AND LEARNING METHODS

Formal Teaching

- a) **Journal Club/Journal Scan:** 1 hour duration - Paper presentation/discussion - once per week.
- b) **Seminar:** One seminar every week of one hour duration
- c) **Lecture/discussion:** Lectures on newer topics by faculty, in place of seminar as per need.
- d) **Case presentation:** Once every week. Post Graduate students will present a clinical case for discussion wherein all PG students and departmental faculty will interact.
- e) **Case conference:** Ward rounds would constitute case conference with faculty.
- f) **Hepato-biliary imaging classes:** Once weekly in which the radiological features of various problems are discussed.
- g) **Hepato-pathological Conference:** Once a week with Pathology department. Special emphasis should be made on histopathology, standard staining, molecular methods and differential diagnosis.
- h) **Combined Round/Grand Round:** Once a week at the hospital level. This should constitute presentation of unusual or difficult cases, clinical series/research data.

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- i) **Emergency situation:** Emergency duty by rotation among the PGs with faculty cover.
- j) **Ward rounds:** Inpatients admitted in wards should be allotted to DM students. The DM student should take history, conduct examination, clinically evaluate and manage. Ward rounds should be conducted by faculty for appropriate patient care and teaching. This should also cover calls from other specialties and emergency.
- k) **Clinical teaching:** In outpatient, ward rounds, emergency and ICU, the postgraduate students shall be required to participate in the teaching and training programme of undergraduate students, interns, junior residents and postgraduate students.
- l) The Department should encourage e-learning activities

Clinical postings: Recommended schedule for three years training:

The Post Graduate student is required to work full time in the department, participate in the patient care and academic and research activities as described below.

Responsibilities of post graduate students during proposed training:

Training should be styled on residency system for 3 years. The post graduate students will be primarily responsible for the care of patients which include clinical, investigative and therapeutic aspects. In addition, they shall pursue research and academic activities in Hepatology with nutrition as an integral part during this period. The training of a DM post graduate student would thus include:

- I. Clinical
- II. Investigative
- III. Therapeutic
- IV. Research activities

(I) Clinical training:

Under the guidance of the consultants, the post graduate students will look after:

- a) Patients in Hepatology outpatient.
- b) Inpatients: each Post Graduate student will be entirely responsible for management of cases and keeping clinical records of allotted patients. This activity should be done under supervision of consultants.



- c) Night duties in ICU, wards, endoscopy theatres and emergency wing by rotation as per exigencies of departmental work.

Clinical training by extensive use of clinical rounds and clinical case discussions. Clinical teaching will be imparted by supervision and guidance of the candidate during day to day patient management in outpatient and wards. In addition, clinical case discussions and rounds will be conducted by the senior staff.

- o The post graduate students should be posted in Departments of Radiology, Pathology, HPB surgery, department/laboratory of Molecular and Cellular Medicine and other laboratories for a period of 6 weeks.
- o Liver transplantation (3 months posting in liver transplantation unit/Centre in the parent institute or in other institute)

The post graduate student should be familiar with liver transplantation, pre-transplantation assessment, immunization, donor and recipient evaluation, graft volumetry, observe transplantation operation procedures to learn all technical details, peri-operative care, post-operative management, ICU care, immunosuppression and follow-up.

(II) Investigations

- a) Essential investigations as part of the clinical training will include:
- (i) Proctosigmoidoscopy
 - (ii) Upper G.I Endoscopy and biopsies
 - (iii) Endoscopic procedures like variceal ligation, sclerotherapy, glue injection, stricture dilatation, APC and stent placement
 - (iv) Colonoscopy, biopsies and polypectomies
 - (v) Endosonography
 - (vi) Interpretation of plain X-ray abdomen and other imagings
 - (vii) Abdominal ultrasonography, CT scanning, MRI, MRCP, doppler studies
 - (viii) Biochemistry: Liver function tests
 - (ix) Hepatitis viral serology and immunology
 - (x) Metabolic tests
 - (xi) Molecular tests

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(xii) Endoscopic Retrograde Cholangiopancreatography (ERCP)

b) **Special investigations** which the DM students must familiarize may be grouped as follows:

1. Radiology: Angiography and embolization
Venography of inferior vena cava & hepatic veins
Liver abscess drainage
Radionuclide scanning
Radiology guided aspiration and stenting
2. Endoscopy: Endoscopic retrograde cholangiopancreatography
Endoscopic papillotomies and stenting
Endosonography
Argon Plasma Coagulation and other hemostatic procedures
Variceal Glue injection, and Oesophageal dilatation
3. Pathology: Histopathology of liver and interpretation of cytopathology,
Immunohistochemistry
4. Transient Elastography of liver
5. Oncology

Hepatobiliary radiology and pathology sessions should be held to enable the candidate to acquire good knowledge and skill in interpretation of various radiological investigations (USG, CT, MRI) and histopathological and cytopathological slides.

Procedures to be carried out independently by DM students during training program

<i>Procedure</i>	<i>Number</i>
Procto- Sigmoidoscopy	100
Upper GI Endoscopy	500
Obtaining endoscopic biopsies from GI tract	100
Colonoscopy	50
Liver biopsy	50
Endoscopic variceal therapy	200
Endoscopic Retrograde Cholangiopancreatography (ERCP)	20

Research: Protocol submission for two research projects related to the field of Hepatology. The students would be required to undertake two research projects with a faculty member as a guide.

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The candidates are required to submit the research protocol within first 6 months of joining the course. The research projects should be approved by the departmental Research Committee and Ethics Committee. The Post Graduate student would be eligible for appearing for exit examination provided the research projects are complete: either published/accepted for publication in indexed journals or external peer review of completed manuscripts is certified by two experts or as per Post Graduate Regulations, 2000.

First Academic Year

- 1. Workup of patients in OPD under supervision.** The DM student should become competent in rendering appropriate outpatient care from evaluation through long-term follow-up or discharge from clinic as indicated for each disease process. The DM student should provide care to patients with a broad range of hepatobiliary diseases and pancreatic disorders. The DM student should be able to organize outpatient evaluation, diagnostic procedures and treatment, including hospital admissions as necessary. The DM student should perform history and examination, review of outside data and present cases to the attending faculty.
- 2. Supervised general and intensive care of admitted patients**
The DM student should become competent in rendering appropriate inpatient care from evaluation to discharge of a broad range of hepatobiliary disease. The DM student should become competent in the performance of diagnostic and therapeutic invasive procedures.
The
DM student should learn to evaluate and ameliorate the psychosocial impact of disease, utilize available ancillary services and deliver cost efficient care.
- 3. Overall**
The DM student will participate, with supervision from attending faculty, in all aspects of the care of patients with hepatobiliary diseases. This care includes initial evaluation, formulation of differential diagnosis and evaluation, participation in diagnostic procedures, interpretation of laboratory, radiologic, pathologic and other testing, treatment and discharge planning.
- 4. Assist in all endoscopic procedures and start performing diagnostic endoscopic procedures in first year of residency under supervision.**



Goals: The DM student should become increasingly proficient in the performance of various hepatobiliary procedures: patient assessment for a specific procedure, sedation, understands procedural techniques and post-procedure monitoring and management. The student should develop skills to become proficient in diagnostic procedures such as upper gastrointestinal endoscopy, percutaneous liver biopsy and bedside procedures. The DM student should observe therapeutic procedures like endoscopic sclerotherapy, banding and glue injections.

Objectives: The DM student will review charts of scheduled outpatient procedures daily, should participate in the consent process, conscious sedation, the procedure, post-procedure management, communication with patients and families and generation of reports. The student should also attend emergency calls.

Second Academic Year

1. Care of admitted and out-patients.
As already laid out for the first year DM student
2. Perform elective diagnostic and therapeutic endoscopies
3. Academic presentation: Seminar, journal club, journal scans and clinical case presentation, monthly patient data statistics, radiology and histopathology case presentations in respective sessions.

Third Academic Year

1. Care of admitted and out-patients
2. Liver transplantation related patient care
3. Should perform emergency, and elective diagnostic and therapeutic endoscopies
4. Academic work as before
5. ERCP and Endosonography
6. Postings in Pathology, Radiology, HPB surgery Departments and different laboratories
7. Analysis and submission of research projects.

Teaching Schedule as enumerated under “Teaching and learning methods”

8. Logbook

A copy of the report of all procedures performed, interesting cases, transplanted cases, awards during the course, abstracts in various conferences should be maintained in a log book, which should be seen by the entire available faculty in the specialty. Logbook should be submitted to

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the Head of the Department at least two months before the exit practical examination. The Log books shall be checked and assessed periodically by the faculty members imparting the training. The Head of the Department will certify the completion of the minimum number of procedures specified. The logbook should be then presented to external examiners at the time of practical exit examination for appraisal.

During the training programme, patient safety is of paramount importance; therefore, skills are to be learnt initially and later to be performed under supervision followed by performing independently. Provision of skills laboratories for cardiopulmonary resuscitation in the medical colleges is mandatory.

ASSESSMENT

FORMATIVE ASSESSMENT

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.

Periodic Evaluation:

Post graduate students will be evaluated continuously for their performance in all areas such as clinical and investigative work, case presentations, seminars, journal clubs, procedures etc. Additional periodic assessment will include theory and practical assessment mimicking the final examination should be conducted every six months. Such an evaluation will help assessing the progress of the trainees and the quality of the training program. Evaluation will be communicated to trainees and their feedback would be taken into consideration for modifications in training program.

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 practical/clinical examination.

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 to be assessed periodically as per categories listed in Postgraduate Student Appraisal form (Annexure I).

SUMMATIVE ASSESSMENT

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

The summative assessment examination shall include two heads:

- A. Theory examination.
- B. Practical, Clinical examination and Viva-voce.

Theory examination and Practical/Clinical, Viva-voce shall be separate heads of passing.

Theory examination shall comprise of four papers. Passing percentage shall be cumulatively 50% with minimum of 40% marks in each theory paper.

Practical /Clinical examination consisting of at least **one long case, three short cases and viva-voce**. Passing percentage shall be 50%.

Passing shall be separate for each head and failing shall be common, meaning thereby that clearance at theory and failure at practical / clinical shall amount to failure at Summative examination and vice versa.

- A. **Theory:** There shall be four theory papers as per MCI norms:

Paper I: Basic Sciences of Hepatology

Paper II: Clinical Hepatology

Paper III: Transplant Hepatology

Paper IV: Advances in Hepatology

- B. **Practical and Oral examination:**

Oral examination shall be comprehensive enough to test the candidate's overall knowledge of the subject. The practical examination shall be held as per MCI norms and as per the prevailing rules of the training institute/ University rules. A broad outline is suggested below:

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- I. Case presentations: 03 cases/ candidate
- II. ICU and ward rounds assessing decision making on management of serious, complicated cases.
- III. Spotters: radiology, histopathology
- IV. Viva Voce/oral examination
- V. Instruments
- VI. Liver transplantation assessment
- VII. Prescription writing and analysis

Suggested Books (latest edition)

1. Gastrointestinal Diseases. Sleisinger & Fordtran
2. Schiff's Diseases of Liver
3. Zakim and Boyer's Hepatology
4. Sherlock's Diseases of liver and Biliary system
5. Oxford Textbook of Hepatology
6. Endoscopy by Sivak
7. Gastroenterology Clinics of North America (series)
8. Endoscopy Clinics of North America (series)
9. Seminars in Liver Diseases (series)
10. Clinics in Liver Diseases (series)

Suggested Journals

3-5 International and 02 national journals (indexed)



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Postgraduate Student Appraisal Form

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

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MODEL PAPER

DM12301

Basic.Sc-I

DM Examination Month, Year

HEPATOLOGY

Paper-I

Basic Sciences in Hepatology

Time: Three Hours

Maximum Marks: 100

Attempt all questions

All questions carry equal marks

Draw labelled diagrams wherever necessary

1. Pathogenesis of hepatic encephalopathy
2. Pathogenesis of sarcopenia in chronic liver disease
3. Discuss the mechanism of action of rifaximin and its role in management of gastrointestinal and hepatic diseases.
4. Level of evidence and grade of recommendation in clinical practice guidelines
5. Pathogenesis of biliary tract cancers.
6. Targeted and immune based therapy for hepatocellular cancer
7. Liquid biopsy for liver diseases
8. Antimicrobial resistance and methods to overcome it
9. Describe the life cycles of cystic and alveolar hydatid disease
10. Covalently closed circular DNA and its significance in HBV infection

aditya kumar

MODEL PAPER

DM12302

Clinical.Hep-II

DM Examination Month, Year

HEPATOLOGY

Paper-II

Clinical Hepatology

Time: Three Hours

Maximum Marks: 100

Attempt all questions

All questions carry equal marks

Draw labelled diagrams wherever necessary

1. Surgical risk assessment in cirrhosis
2. TIPSS: indications and outcomes
3. Albumin in liver: role and outcomes
4. Discuss indications for stopping antiviral therapy in HBV and patient monitoring after treatment withdrawal.
5. Non-invasive markers for non-alcoholic steatohepatitis
6. Refractory gastric variceal bleed: management
7. Management of portal vein thrombosis in cirrhosis
8. Primary and secondary prophylaxis of variceal bleeding
9. Management of hydatid cyst of liver
10. Role of plasmapheresis in liver disease



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MODEL PAPER

DM12303

Trns.Hep.-III

DM Examination Month, Year

HEPATOLOGY

Paper-III

Transplant Hepatology

Time: Three Hours

Maximum Marks: 100

Attempt all questions
All questions carry equal marks
Draw labelled diagrams wherever necessary

1. Diagnosis and treatment of hepatopulmonary syndrome. What is its impact on LT?
2. Discuss ICU management of acute liver failure.
3. How should post-LT immunosuppression be modified based on etiology of liver disease in the recipient?
4. Current status of artificial liver assist devices.
5. Eligibility criteria and recipient evaluation for LT in HCC. How do criteria and evaluation differ between DDLT and LDLT?
6. Discuss the evaluation and management of postoperative bile leaks after DDLT and LDLT including the role of nonsurgical management.
7. Discuss diagnosis and management of early allograft dysfunction after LDLT.
8. Discuss indications, assessment and management of the patient undergoing combined liver-kidney transplantation.
9. What is brain death? Discuss the procedure for declaring brain death according to the Human Organ Transplant Act (HOTA).
10. What are the special considerations in patients undergoing LT for ACLF? Discuss futility of LT in ACLF.



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MODEL PAPER

DM12304

Adv.Hep.-IV

DM Examination Month, Year

HEPATOLOGY

Paper-IV

Advances in Hepatology

Time: Three Hours

Maximum Marks: 100

Attempt all questions

All questions carry equal marks

Draw labelled diagrams wherever necessary

1. What is CAR-T Cell therapy for cancer? What is its role in HCC?
2. Directly-acting antiviral agents for chronic hepatitis B.
3. Current status of newer drugs for NAFLD.
4. Current status of fecal microbiota transplant (FMT) in liver disease.
5. Enumerate available options for endoscopic bariatric and metabolic therapies (EBMT).
Discuss duodenal mucosal resurfacing (DMR).

Dr. Viveka Saraswat

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Principal & Controller
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S. M.

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