



ODISHA UNIVERSITY OF HEALTH SCIENCES, BHUBANESWAR



PG Curriculum DM Hepatology

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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 super specialty 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 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

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

- 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.
- 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, glueinjection, 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, dopplerstudies
- (viii) Biochemistry: Liver function tests
- (ix) Hepatitis viral serology and immunology
- (x) Metabolic tests
- (xi) Molecular tests
- (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 cana & 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 Cholangiopancreaticography (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. 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 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

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:

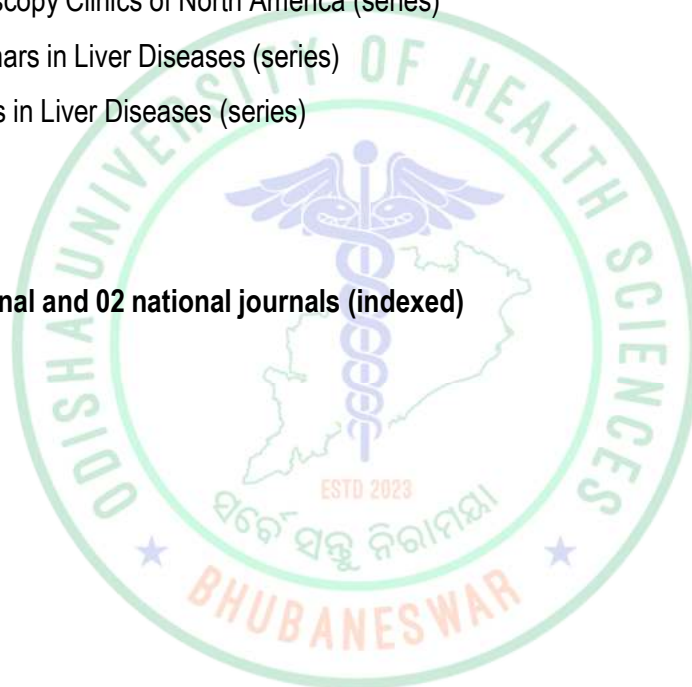
- I. Case presentations: 03 cases/ candidate
- II. ICU and ward rounds assessing decision making on management of serious, complicated cases.
- III. Spotters: radiology, histopathology
- IV. Viva Voce/oral examination
- V. Instruments
- VI. Liver transplantation assessment
- VII. Prescription writing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



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