

**THE TAMILNADU Dr.M.G.R. MEDICAL UNIVERSITY,
No.69, Anna Salai, Guindy, Chennai – 600 032.**

**D.M/ M.Ch
SUPER SPECIALTY DEGREE COURSE**



SYLLABUS AND CURRICULUM

2017-2018

D.M. - NEPHROLOGY

THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY, CHENNAI
Syllabus – D.M NEPHROLOGY

AIMS AND OBJECTIVES:

- (i) The DM course in Nephrology is designed to train the candidates with the objectives to impart a thorough knowledge in the subject as well as practical skills required to work as an independent consultant in the field of Nephrology and impart knowledge and skills to their students.
- (ii) The Training is also intended to develop in them the art of effective communication and enthusiasm in updating information.
- (iii) The training also imparts knowledge in research methodology and evokes interest in research.

THEORY SYLLABUS:

I. ANATOMY:

- 1. Gross Anatomy Embryology Histology including Electron Microscopy study of the Kidney.

II. PHYSIOLOGY:

- 1. Renal circulation and Glomerular ultrafiltration.
- 2. Solute transport / Both Organic and inorganic.
- 3. Renal Acidification.
- 4. Urine Concentration & Dilution.
- 5. Role of Kidney in Blood pressure regulation.
- 6. Endocrine and Autocrine functions of the kidney.

III. INTEGRATED CONTROL OF BODY FLUID VOLUME AND COMPOSITION:

- 1. Vasoactive peptides / Arachidonic Acid Metabolites.
- 2. Sodium – Water Balance.
- 3. Potassium Balance
- 4. Acid Base Balance
- 5. Calcium and Phosphorus Metabolism.
- 6. Magnesium metabolism.
- 7. Renal Handling of Uric acid

IV. APPROACH TO THE PATIENT WITH KIDNEY DISEASE:

- 1. Approach to the patient with Kidney Disease
- 2. Laboratory Assessment of Kidney Disease including Biopsy

3. Interpretation of Electrolyte and Acid – Base Parameters in Blood and Urine
4. Adaptation to Nephron Loss
5. Renal and Systemic Manifestations of Glomerular Disease.
6. Diagnostic Kidney Imaging
7. Interventional Nephrology

V. EPIDEMIOLOGY OF KIDNEY DISEASE:

1. Epidemiology of Kidney Disease
2. Risk Factors and Kidney Disease
3. Nephron Endowment
4. Gender and Kidney Disease
5. Aging and Kidney Disease

VI. DISORDERS OF KIDNEY FUNCTION

1. AKI – Pathogenesis / Diagnosis / Therapy
2. Glomerular disease – Primary and Secondary
3. Micro and Macro Vascular Diseases of the kidney
4. Tubulo Interstitial Diseases
5. UTI / Pyelo Nephritis / Reflux Nephropathy
6. Urinary tract obstruction and Obstructive Nephropathy
7. Diabetic Nephropathy
8. Nephrolithiasis
9. Renal Neoplasia
10. Kidney disease in tropics
11. Pregnancy and Kidney diseases.

VII. INHERITED DISEASES OF THE KIDNEY:

1. Inherited Disorders of Podocyte Function
2. Inherited Disorders of the Renal Tubule
3. Cystic Diseases of the Kidney

VIII. PAEDIATRIC NEPHROLOGY

1. Developmental Nephrology
2. Congenital diseases of the kidneys, ureters, urinary bladder and urethra.
3. Glomerular and tubular diseases
4. Systemic diseases affecting the kidney
5. Acute and Chronic Kidney Failure
6. Dialysis and Transplantation with respect to Pediatric Nephrology.

IX. HYPERTENSION AND KIDNEY :

1. Primary and Secondary Hypertension
2. Renovascular Hypertension and Ischemic Nephropathy
3. Hypertension and Kidney Disease in Pregnancy
4. Antihypertensive Drugs
5. Diuretics

X. CHRONIC KIDNEY DISEASE:**1. Pathophysiology of Uremia and its Systemic manifestation**

- i. Pathophysiology of Uremia
- ii. Cardiovascular Aspects of Chronic Kidney Disease
- iii. Hematologic Aspects of Kidney Disease
- iv. Endocrine Aspects of Kidney Disease
- v. Neurologic Aspects of Kidney Disease
- vi. Mineral Bone Disorders in Chronic Kidney Disease.
- v. Continuous Renal Replacement Therapy (CRRT)

2. Conservative and Pharmacological management:

- i. Diet and Kidney Disease
- ii. Specific Pharmacologic Approaches to Clinical Renoprotection
- iii. Erythropoietin Therapy in Renal Disease and Renal Failure
- iv. Vitamin D, Calcimimetics, and Phosphate Binders
- v. Prescribing Drugs in Kidney Disease

3. Invasive Management.

- i. Hemodialysis
- ii. Peritoneal Dialysis
- iii. Intensive Care Nephrology
- iv. Plasmapheresis
- v. Extracorporeal Treatment of Poisoning

XI. RENAL TRANSPLANTATION

- 1. Transplantation Immunobiology
- 2. Donor and Recipient Issues
- 3. Clinical Management

XII. RECENT ADVANCES

- i. Attaining Immunologic Tolerance
- ii. Xenotransplantation
- iii. Tissue Engineering and Regeneration
- iv. Stem Cells in Renal Biology and Medicine

Bioethics

- 1. Respect human life and the dignity of every individual
- 2. Refrain from supporting or committing crimes against humanity and condemn all such acts
- 3. Treat the sick and injured with competence and compassion and without prejudice and apply the knowledge and skills when needed.
- 4. Protect the privacy and confidentiality of those for whom we care and breach that confidence only when keeping it would seriously threaten their health and safety or that of others
- 5. Work freely with colleagues to discover, develop, and promote advances in medicine and public health that ameliorate suffering and contribute to human well being
- 6. Educate the public about present and future threats to the health of humanity
- 7. Advocate for social, economic, educational and political changes that ameliorate suffering and contribute to human well being.
- 8. Teach and mentor those who follow us, for they are the future of our caring profession.

CLINICAL TRAINING

The students will be clinically trained in parent department during the 3 years course.

POSTINGS:

1. Male Ward	-	7 Months
2. Female Ward	-	7 Months
3. Hemodialysis Unit	-	5 Months
4. Transplantation	-	7 Months
5. CAPD	-	2 Months
6. Interventional Nephrology	-	2 Months

The specified period of postings is minimum required. The duration of postings may vary with the number of Post Graduates.

Special Postings

(a) Pediatric Nephrology Department	-	2 Months
(b) Radiology	-	15 days
(c) Rheumatology including Immunology	-	15 days
(d) Lab Services	-	1 Month
(e) Postings in Nephrology Department of other centers	-	2 months

During II year, students are encouraged to undergo special postings for learning new advanced techniques / Procedure / Skills in institutions of higher repute where the requisite facilities are available without affecting the regular work of the parent department.

SKILL TRAINING:

DIALYSIS

(a) HEMODIALYSIS

The candidates will be posted in Hemodialysis units in rotation where he or she will be trained in both technical and clinical aspects of Hemodialysis including double lumen venous catheterization, Dialyzer reuse etc. They will also be trained in Continuous Renal Replacement Therapy (CRRT) – mode of dialytic therapy in critically ill patients.

The candidates will also be trained during this period in plasmapheresis and Hemoperfusion.

(b) PERITONEAL DIALYSIS

All candidates will be trained to perform acute intermittent Peritoneal Dialysis including its benefits and complications. Apart from that they will be trained in the management of Continuous Ambulatory Peritoneal Dialysis (CAPD) patients.

INTERVENTIONAL NEPHROLOGY

1. The post graduates are trained in the placement of permanent tunneled catheter for patients planned to undergo HD.
2. The post graduates are trained in the placement of percutaneous CAPD catheterization.
3. The post graduates are also trained in performing USG guided needle biopsy of both native and transplant kidney.
4. The post graduates are also exposed to procedure of AVF creation.

RENAL TRANSPLANTATION

The candidates will be trained in the workup of living kidney donors and recipients and prepare recipients for Renal Transplantation, manage them post operatively in the immediate and long term follow up.

They will also be trained in wait listing the appropriate Chronic Renal Failure (CRF) patients without living donors, preparing them for Renal Transplantation as and when the cadaver renal donor is available and managing them post operatively.

TEACHING METHODOLOGY

(i) The candidates will work in the department under the guidance of Assistant Professors, Associate Professors and Professors. They will be trained in the decision making process both in clinical and investigative aspects of nephrology. The candidates shall work taking up the responsibility of investigative and therapeutic management of patients under the guidance of senior teachers in nephrology.

(ii) The candidates will attend nephrology out patient department and Renal transplant OP. The candidates will write case sheets of the new patients and discuss the problems of old patients with Associate Professor and Professor of Nephrology.

(iii) As part of training in order to enhance decision making skills, Post graduates will perform in house duties in turns.

(iv) The candidates will be posted in the wards including transplant and dialysis departments for a stipulated period for which they are primarily responsible to take decisions in investigating and managing these patients, under the guidance of Assistant Professors, Associate Professors and Professors.

The faculty members of department will be primarily responsible for teaching. In addition the following departments will be involved in the teaching Programme of DM Nephrology Post Graduates.

- a. Urology
- b. Radio Diagnosis

- c. Pathology including Immuno Pathology
- d. Microbiology

The teaching schedule will be as follows, however the details may change time to time depending on the evolving circumstances.

S.NO.	TEACHING EXERCISE	FREQUENCY
1.	Nephrology Grand Rounds	Once a week
2.	Clinical Bed side discussions	Once a week
3.	Seminars	Once in 2 weeks
4.	Journal Club	Once in 2 weeks
5.	Topic review	Once in 2 weeks
6.	Short Topic discussion	4 days per week
7.	Renal Histo pathology discussion	once a week
8.	Nephrology - Internal Medicine case discussion	Once a week
9.	Nephrology case discussion	Once in 2 weeks
10.	Renal Radiology Rounds	Once in 2 weeks
11.	Nephro Urology Clinic	Once in 2 weeks

The Teaching Programme will include:

1. Urology Lectures
2. Lectures in Statistics
3. Diet in Renal Disease

RESEARCH WORK

The candidate is introduced to the field of research in Nephrology; both at clinical and laboratory level.

The candidate will be trained in the ability to

- Frame a research question.
- Plan a study to answer the question.
- Collect the relevant information and
- Evaluate appropriately the collected data to draw a conclusion.

The candidate should become conversant with the reporting of these results as a research paper, in journals and as a presentation in conferences.

The activities would consist of:

Planning and organizing relevant studies to be submitted as a Research paper at the end of the course. The topics for research and presentation should be finalized and ethical committee approval should be obtained by the end of first year of the course.

Students should compulsorily attend Research methodology workshop conducted by the University within first six months of D.M. Course.

LOG BOOK:

The Postgraduate student of a Postgraduate Degree Course in Super specialties shall maintain 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.

The Log Book shall be checked and assessed by the faculty members imparting the training.

Periodical evaluation of Log Book to be done by the Head of the Department.

The Evaluation of the candidates in both theory and practical aspects will help the candidate in the improvement of his/her knowledge skills & attitude.

COMPETENCY ASSESSMENT:

Overall:

1. Communication / Commitment / Contribution / Compassion towards patients and Innovation	-	10 Marks
2. Implementation of Newly learnt techniques	-	10 Marks
3. Documentation of case sheets / discharge Summary / Review	-	10 Marks
4. Number of cases presented in Clinical Meetings/ Journal Clubs / Seminars / Papers presented in Conference.	-	10 Marks
5. No. Of Medals/ Certificates won in the conference / Quiz competitions and other academic meetings with details.	-	10 Marks

	Total	50 Marks

Assessment	I	- February	-	First Year
	II	- August	-	First Year
	III	- February	-	Second Year
	IV	- August	-	Second Year
	V	- February	-	Third Year
	VI	- May	-	Third Year

VIVA INCLUDING COMPETENCY ASSESSMENT – 100 Marks (50+50)

THEORY EXAMINATION

Paper I : Nephrology – Basic Sciences

Paper II : Clinical Nephrology, Dialysis, Transplantation

Paper III : Nephrology - Dialysis & Transplantation

Paper IV: : Recent Advances

Each paper will contain:

1. Essay questions (2)	-	2 X 15 =	30 Marks
2. Short Notes (10)	-	10 X 7 =	70 Marks
Total			----- 100 Marks -----

CLINICAL EXAMINATION:

Particulars	Time for candidate to examine the cases	Time for examiners to question the candidates	Maximum Marks
Long Case	1 Case x 60 Minutes	60 Minutes	100
Short Case	2 Cases x 15 Minutes	30 Minutes	100
Ward Rounds	3 Patients x 10 Minutes	30 Minutes	100
OSCE	5 Stations x 3 Minutes	15 Minutes	50
Viva Voce		15 Minutes	100
Log Book			50
Total			500

As per Medical Council of India Post Graduate Medical Education Regulations 2000 (amended upto 10th August 2016) clause **13.9 A Postgraduate 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.**

A part from Poster/Oral paper presentation in National/State conferences, the

Research paper published by the candidate in the University Journal of Medical Sciences will be considered as equivalent to the Research Paper as mentioned in 13.9. clause. Case Reports can also be published in University Journal of Medical Sciences but case reports will not be considered as Research Paper.

The candidate can also present Research Paper as per Clause 13.9 of Post Graduate Education Regulation 2000, and if the article sent for publication by the candidate as primary author or corresponding author which has not yet been published/accepted for publication, the candidate should submit a letter from the HOD, stating that the article sent for publication is of publishable merit and the proof of the Research Article submitted to the Journal for publication should be sent to the university forwarded through the HOD [as per 53rd SAB]

The student can submit articles for the University journal anytime from the time of registration in the University till 6 months prior to theory examination.

OSCE: (5 Stations)

1. Clinical Scenario - 2 stations
2. Hemodialysis scenario
3. Arterial Blood gas/dyselectrolytemia interpretation
4. Pathology slide/specimen
5. Radiology

REFERENCE BOOKS:

1. Schrier's Diseases of the Kidney - ninth edition
2. Brenner & Rector's The Kidney – tenth Edition
3. Comprehensive Clinical Nephrology (Johnson, Feehally) – Fifth Edition
4. Principles and Practice of Dialysis (Henrich) – Fourth Edition
5. Kidney Transplantation (Peter. J. Morris) – Seventh Edition

****Note:** The editions are as applicable and the latest editions shall be the part of the syllabi.

JOURNALS RECOMMENDED:

1. Indian Journal of Nephrology
2. American Journal of Kidney Diseases
3. Journal of American Society of Nephrology
4. Clinical Journal of American Society of Nephrology
5. American Journal of Transplantation
6. Kidney International
7. Nephrology Dialysis Transplantation
8. Hemodialysis International
9. Peritoneal Dialysis International
10. Nature Reviews Nephrology
11. Clinical Kidney Journal.
