



YENEPOYA MEDICAL COLLEGE HOSPITAL

(A CONSTITUENT COLLEGE OF YENEPOYA UNIVERSITY)

Recognised under Sec.3 (A) of UGI Act. 1956

Accredited by NAAC with 'A' Grade

**FELLOWSHIP COURSE
In
NEPHROLOGY
curriculum and syllabus**

Yenepoya Medical College Hospital & Research Centre

Yenepoya University
University Road, Deralakatte,
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**Curriculum
Fellowship in Dialysis and Transplant
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FELLOWSHIP COURSE IN NEPHROLOGY

1. GOALS

The goal of Nephrology fellowship course is to produce a competent fellow who:

- Has acquired the competence pertaining to Nephrology that is required to be practiced in the community and at all levels of health care system
- Has acquired the skills to manage the patient effectively pertaining to nephrology
- Has acquired skill in effectively communicating with patient and his attendants.
- Has the desired skills to independently manage emergency cases
- Is aware of the latest developments in the field of nephrology oriented to principles of research methodology
- Has acquired skills in educating medical and paramedical professionals.

B.OBJECTIVES

At the end of the Nephrology fellowship course, the student should be able to

- practice the specialty of nephrology in keeping with the principles of professional ethics
- recognize and identify the various renal problems
- institute diagnostic, therapeutic, rehabilitative and preventive measures to provide holistic care to the patient
- take detailed history, perform full physical examination and make clinical diagnosis, perform relevant investigative and therapeutic procedures
- interpret important imaging and laboratory results
- Independently perform basic surgical procedures
- manage emergency efficiently
- Demonstrate empathy and human approach towards patients and their families.
- demonstrate communication skills of a high order in explaining management and prognosis, providing counseling and giving health education to patients, families and communities,
- develop skills as a self-directed learner, recognize continuing educational needs, use appropriate learning resources, and critically analyze relevant published literature in order to practice evidence-based medicine, facilitate learning of medical/nursing students, practicing physicians, paramedical health workers and other providers as a teacher/trainer
- organize and supervise the desired managerial and leadership skills

2. COURSE OVERVIEW

Duration of the Course

The period of study and training for the Nephrology fellowship shall be Two Academic years including examination process.

Commencement of Academic Session

The academic session for the Post-Graduate shall commence as per university schedule

Eligibility criteria :

The candidates who have passed MD/ DNB in general medicine or any equivalent degree recognized by the university.

Number of Examinations

The University shall conduct not more than two examinations in a year, with an interval of not less than four (4) and not more than six (6) months between the two examinations.

Attendance

All students joining the fellowship training programme shall work as full time residents during the period of training, attending not less than 80% (eighty percent) of the training during each calendar year, and will be given full time responsibility, assignments and participation in all facets of the educational process.

3. COURSE CONTENT

TRAINING METHODS AND AREAS OF TRAINING

- i. The candidates will work in the department under the guidance of Faculty of the department. 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 outpatient department and Renal transplant OP. The candidates will write case sheets of the new patients and discuss the problems of old patients with the faculty of the department.
- iii. Training in renal biopsy and interpretation of biopsy and other invasive procedures will be given.

- iv. The candidate shall maintain a log book which shall be received by the assigned faculty of the department

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, permcath insertion. Dialyser 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 Continuous Ambulatory Peritoneal Dialysis (CAPD) patients.

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 EXERCISE FREQUENCY & DURATION

- | | | |
|----------------------------------|-----------------------------|----|
| 1. Nephrology Grand Rounds | - Once a week 3 Hours | |
| 2. Clinical Bed side discussions | - Four times a week 2 Hours | |
| 3. Seminars | - Once in 2 weeks 2 Hours | |
| 4. Journal Club | - Once in a week 1 Hour | 5. |

- | | |
|-------------------------------|------------------------------|
| 5. Topic review | - Once in 2 weeks 1 Hour |
| 6. Topic discussion | - 3 days per week 40 Minutes |
| 7. Renal Histopath discussion | - Once a week 1 Hour |
| 8. Nephrology case discussion | - Once in 2 weeks 2 Hours |
| 9. Renal Radiology meet | - Once a week 1 Hour |

4. SYLLABUS

ASSESSMENT OF RENAL DISEASE

History and clinical examination of patients with renal disease
Urinalysis and microscopy
Clinical assessment of renal function
Renal function in the newborn infant
The aging kidney
Imaging in renal disease
Renal biopsy
Immunological investigation of renal disease

BASICS

Embryology of the kidney
Anatomy of the kidney
Renal circulation
Biostatistics
Research Methodologies
Solute transport / Both organic and inorganic
Renal Acidification
Urine Concentration & Dilution
Role of kidney in blood pressure regulation
Endocrine and Autocrine function of the kidney

PHARMACOLOGY AND DRUG

Handling of drugs in kidney disease
Drug-induced nephropathies
Clinical use of diuretics
Systemic cancer therapies and the kidney

FLUID AND ELECTROLYTE DISORDERS

Hypo-/hypernatremia: disorders of water balance
Hypo-/hyperkalemia
Hypo-/hypercalcemia
Hypo-/hyperphosphatemia
Hypo-/hypermagnesemia
Clinical acid-base disorders

EPIDEMIOLOGY AND RISK FACTORS

Epidemiology of kidney disease
Kidney disease in Indian subcontinents
Risk factors of CKD
Nephron endowment
Aging and kidney disease

PEDIATRIC NEPHROLOGY

Malformation of the kidney
Fluid, Electrolyte, Acid base disturbance
Disease of kidney and Urinary track
Dialysis in Children
Pediatric Transplantation

GLOMERULAR DISEASE

Proteinuria and/or hematuria
Nephrotic syndrome
Minimal change disease
Focal segmental glomerulosclerosis
Immunoglobulin A nephropathy and Henoch-Schönlein purpura
Membranous nephropathy

Mesangiocapillary Glomerulonephritis
Acute endocapillary glomerulonephritis
Crescentic glomerulonephritis
Antiglomerular basement membrane (Goodpasture's) disease
Infection-related Glomerulonephritis
Malignancy-associated glomerular disease
Glomerular disease in the tropics

THE KIDNEY IN SYSTEMIC DISEASE

Diabetes mellitus
Amyloid and immunotactoid glomerulopathy
Plasma cell dyscrasias
Sarcoidosis
Systemic vasculitis
Mixed cryoglobulinemia and hepatitis C infection
Systemic lupus erythematosus
Scleroderma-systemic sclerosis
Rheumatoid arthritis, connective tissue disease, and Sjögren's syndrome
Sickle cell neuropathy
Cancer and the kidney

TUBULAR DISEASE

Isolated defects of tubular function
Fanconi syndrome
Renal tubular acidosis
Hypokalemia tubular disorders
Nephrogenic diabetes insipidus

CHRONIC INTERSTITIAL DISEASE

Analgesic nephropathy
Nonsteroidal anti-inflammatory drugs and the kidney
Nephrotoxic metals
Balkan nephropathy
Aristolochic acid nephropathy ('Chinese herb nephropathy') and other rare causes of chronic interstitial nephritis

URINARY TRACT INFECTION

Lower and upper urinary tract infection in adults
Urinary tract infection in children
Renal tuberculosis or other mycobacterial infections
Fungal infections and the kidney

RENAL STONE DISEASE

Medical management of stone disease
Surgical management of stone disease
Nephrocalcinosis
Renal stone disease in children

ACUTE KIDNEY INJURY (AKI)

Clinical approach to AKI
Renal replacement therapies in AKI
Dialysis and hemoperfusion treatment of acute poisoning
Glomerulonephritis, vasculitis, and nephritic syndrome
Acute tubulointerstitial nephritis
Hemolytic uremic syndrome and thrombotic thrombocytopenic purpura
Hepatorenal syndrome
Ischemic AKI
Pigment-induced AKI
AKI in tropical countries
AKI in infants and children
AKI in pregnancy
AKI in the elderly

CHRONIC KIDNEY DISEASE (CKD)

Assessment of CKD
Endocrine disorders in CKD
Sexual disorders in CKD
Hypertension in CKD
Cardiovascular risk factors in CKD
Gastrointestinal disorders in CKD
Liver disorder in CKD

Hematological disorders in CKD
Skeletal disorders in CKD
β₂-Microglobulin amyloidosis in CKD
Immune function in CKD
Coagulation disorders in CKD
Dermatologic disorders in CKD
Neuropsychiatric disorders in CKD

SPECIAL PROBLEMS IN CKD

CKD in children
CKD in the elderly
CKD in diabetic patients
CKD in pregnancy

DIALYSIS

Dialysis strategies
Vascular access
Hemodialysis, hemofiltration and hemodiafiltration
Peritoneal dialysis
Adequacy of dialysis
Medical management of the dialysis patient
Psychological aspects of treatment for renal failure

RENAL TRANSPLANTATION

Donor & Recipient issues
Transplantation immunobiology
Medical & surgical complications following transplantation
Early management of transplant recipients
Immunosuppression for renal transplantation

INHERITED RENAL DISEASE

Investigation of inherited renal disease
Autosomal dominant polycystic kidney disease
Nephronophthisis

Alport's syndrome
Primary hyperoxalurias

STRUCTURAL AND CONGENITAL ABNORMALITIES

Renal dysplasia
Vesicoureteric reflux and reflux nephropathy
Urinary tract obstruction
Congenital abnormalities of the urinary tract

Medullary sponge kidney

DURATION OF THE COURSE: – 2 YEARS:

5. MAINTENANCE OF LOG BOOK

Log book (Performance record book):

Maintaining Log book (recording the work done during the course) is mandatory. The log book should be reviewed and assessed by the faculty of the department and shall be made available at the time of practical examination for review by examiners.

Log book should contain:

1. Certificate duly signed by incharge Faculty, Head of department, Head of Institution stating that Dr..... has worked in the department for a period of 2 years from.....to.....

2. Record of training:

- Name of the trainee.
- Name of the Hospital.
- Training period.
- Name of Faculty Incharge.

3. Postings.

4. Working schedule.

5. Teaching programme.

6. Presentation in Journal club: Date, Article Name, Assessment.

7. Seminars: Date, Topic / Subject, Assessment.

8. Case presentation: Date, Teacher's Signature.

9. Death Audit / C PC: Date, Case discussed, Assessment & Signature.

10. Procedures: Date , Name of patient, Type, Complications observed.

11. Teaching activity: Date, Topic, Class.

12. Participation in departmental Research activity.

13. Conference / Workshop attended paper and poster presentation (State/ National Conferences)

6. SCHEME OF EXAMINATION

INTERNAL ASSESSMENT:

Marks allocated for internal assessment will be 200 and divided accordingly as given below.

- 1) Personal Attributes – 20
 - 2) Clinical Work - 40
 - 3) Academic Activity - 40
 - 4) Theory (average of two internal assessment) – 50
 - 5) Practical (average of two internal assessment) - 50
- 1st Internal Assessment will be done at the end of first Academic year
2nd Internal Assessment will be Before university exam

EXAMINATION

Consists of theory, clinical and oral examination.

I. THEORY:

I. 4 papers

Paper I: Basic Sciences as applied to Nephrology

Paper II: Clinical Nephrology

Paper III: Dialysis and Transplantation

Paper IV: Recent Advances

Duration: 3 Hours

Marks for each paper: 100

(ii) Type of questions

1 Essay for 20 marks = 20

8 Short for 10 marks each = 80

Total	100

II. CLINICAL AND ORAL EXAM

There should not be more than 3 candidates per day.

There will be 1 external and 1 internal examiners.

(c) PATTERN OF EXAMINATION

(i) Clinical

1 long case - 1 hour
2 Short Cases - 30 minutes each.
Ward Rounds (4 cases)

(ii) Oral Examination

Viva
2 Histopathology slides
2 Radio imaging projections

(d) TOTAL MARKS

(i) Theory

Paper I - 100 Marks
Paper II - 100 Marks
Paper III - 100 Marks
Paper IV - 100 Marks

Total - 400 Marks

(Separate minimum marks required to pass theory exam = 200 marks)

(ii) Clinical

Long Case - $100 \times 1 = 100$
Short Case - $50 \times 2 = 100$
Ward Rounds - $25 \times 4 = 100$
Total = 300

(iii) Oral

Viva - 50 Marks
2 Histopathology slides – 25 Marks
2 Radio imaging projections – 25 Marks
Total - 100 Marks
Clinical and Oral total 400

(Separate minimum marks required to pass in clinical /practical and viva voce exam = 200)

MARKS QUALIFYING FOR A PASS		
	Maximum Marks	Qualifying for a pass 50% Marks
Internal Assessment	200	100
Theory	400	200
Clinical and Viva Voce	400	200

A student shall secure not less than 50% marks in each head of passing, which shall include 1. Internal Assessment, 2.Theory, 3.Practical including clinical and viva voce examination.

7. EXAMINATION AND EVALUATION

I. EXAMINERS

(a) All the Post Graduate Examiners shall be recognised Post Graduate Teachers holding recognised Post Graduate qualifications in the subject concerned.

(b) For all Post Graduate Examinations, the minimum number of Examiners shall be two, out of which at least one (50%) shall be External Examiner, who shall be invited from other recognised universities.

II. NUMBER OF EXAMINATIONS

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

III. Theory

There shall be four theory papers, one paper out of these shall be on Basic Medical Sciences, and another paper on Recent Advances. The theory examination will be held sufficiently earlier than the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the start of the clinical/Practical and Oral examination.

IV. Clinical / Practical and Oral

Practical examination shall consist of carrying out special investigative techniques for Diagnosis and Therapy. Oral examination shall be comprehensive to test the candidate's overall knowledge of the subject.

8. MODEL QUESTION PAPER

FELLOWSHIP COURSE IN NEPHROLOGY Paper I –BASIC SCIENCES AS APPLIED TO NEPHROLOGY

Time: 3 hours
Answer ALL questions

Maximum: 100 marks

I. Elaborate on: (1 x 20 = 20)

1. How do you investigate a patient suspected to have renal tubular acidosis, outline the management of type 1 renal tubular acidosis?

II. Write notes on: (10 x 8= 80)

1. What is tubular maximum, define renal glycosuria and its clinical implications.
2. Factors affecting glomerular filtration rate, what are the methods available to estimate it
3. Mode of action and indications for the use of Metolazone.
4. Genetics of polycystic kidney disease and the implications of this.
5. Indications for the combined use of angiotensin converting enzyme inhibitors and angiotensin receptor blockers advantage or not.
6. What are the prognostic factors in a case of IgA nephropathy.
7. Role of fish oil in management of renal diseases.
8. What is the fractional excretion of sodium , its diagnostic significance.

FELLOWSHIP COURSE IN NEPHROLOGY

PAPER – II CLINICAL NEPHROLOGY

Time: 3 hours

Maximum : 100marks

Answer All questions

I. Elaborate on:

(1 x 20 = 20)

1. What is amyloid? How is it classified? Describe the renal lesions in amyloidosis.

II. Write notes on:

(10 x 8 = 80)

1. What is pseudohyperkalemia? What are the manifestations of acute hyperkalemia and how do you treat this?
2. How would you investigate a case suspected to have diabetes Insipidus? What is the differential diagnosis?
3. What is the current opinion on the role of Dopamine in acute kidney Injury?
4. What are the RIFLE and AKIN classification? What is the difference between the two and advantages of each?
5. Describe the kidney lesions seen with malarial infection.
6. What is the abnormal serology and pathology seen in the kidney in Wegners Granulomatosis? How is the condition treated?
7. What is Schols solution? What is its composition and indications for its use?
8. What are direct renin inhibitors? What is the advantage of using it over converting enzyme inhibitors or angiotensin receptor blockers?

Paper III – FELLOWSHIP COURSE IN NEPHROLOGY

Time: 3 hours

Maximum: 100 marks

Answer ALL questions

I. Elaborate on:

(1 x 20 = 20)

1. Hepatitis C virus infection associated kidney disease. Add a brief note on pre kidney transplant management of a case with this infection.

II. Write notes on:

(10 x 8 = 80)

1. Use of citrate for hemodialysis. What are the indications and precautions?
How is it done?

2. Wilhelm Kolff and his contributions to care of patients with kidney disease.

3. Use of plasma exchange in nephrology.

4. Hanta virus and renal lesions associated with this infection.

5. Renal lesions seen with Mycobacterium leprae infection.

6. What are the variants of focal segmental glomerulosclerosis? Discuss the prognosis after kidney transplant in a patient with this condition.

7. Use of Tacrolimus for non organ transplant situations and efficacy.

8. What predisposing factors, clinical features, histology, treatment and Outcome of Atheroembolic renal disease?

FELLOWSHIP COURSE IN NEPHROLOGY

Paper – IV RECENT ADVANCES

Time: 3 hours

Maximum: 100 marks

Answer ALL questions

I. Elaborate on:

(1 x 20 = 20)

1. Indications for the use of mTOR inhibitors post kidney transplant, side effects and management of a patient on mTOR.

II. Write notes on:

(10 x 8 = 80)

1. Use of stem cell therapy in Nephrology.

2. Usefulness of allograft biopsy in the management of a kidney transplant recipient.

3. Indications, procedure, advantages and disadvantages of automated Peritoneal Dialysis.

4. What is Microinflammation? What is the evidence for its role in chronic kidney disease?

5. Use of Bortezomib in Nephrology.

6. Renal involvement with snake envenomation, lesions, treatment and outcome.

7. Variants of minimal change nephropathy, management of a steroid dependent child with this condition.

8. Enumerate podocyte disorders and write briefly on the Finnish type of congenital nephritic syndrome.

10.RECOMMENDED BOOKS AND JOURNALS:

1. Diagnostic Atlas of Renal Pathology,Fogo,Agnes B 7th ED. Elsevier , 2005
2. Clinical Dialysis,Nissenson,Allen R,4th ED. Mc Graw Hill, 2005
3. Hypertension companion to to Brenner & Rectors the Kidney,Oparil,Suzanne, 2nd Ed. Elsevier, 2005
4. Nephrology Secrets,Brown, David E,2nd ED. Elsevier, 2003
5. Disease of the Kidney & Urinary tract ,Schrier,Robert W,8th ED.Vol I, Lippincott, 2007
6. Disease of the Kidney & Urinary tract ,Schrier,Robert W,8th ED.Vol II, Lippincott, 2007
7. Disease of the Kidney & Urinary tract ,Schrier,Robert W,8th ED.Vol III, Lippincott, 2007
8. Comprehensive Clinical Nephrology, Feehally, John, 3rd ED. Mosby 2007.
9. Renal Diseases Prevevntion and Management:A physicians perspective,Feehally, John , Jaypee Brothers, 2008.
10. Seldin and Giebischs the Kidney: Physiology and Pathophysiology,Alpern,Robert. J,Vol I 4th ED. Academic Publisher, 2008
11. Seldin and Giebischs the Kidney: Physiology and Pathophysiology,Alpern,Robert. J,Vol II 4th ED. Academic Publisher, 2008
12. Comprehensive Pediatrics Nephrology, Geary, Denis. F (ED), 1st ED. Elsevier 2008.
13. Evidence-Based Nephrology, Molony, Donald. A, John wiley, 2009
14. Handbook of Dialysis, Daugirdas, John. T, 4th ED. Lippincott, 2009
15. Manual of Nephrology, Schrier, Robert.W,7th ED. Lippincott, 2009
16. Oxford Handbook of Dialysis,Levy, Jeremy,2nd ED. Oxford, 2007
17. Ganongs Review of Medical Physiology, Barrett, Kim. E (Etal), 24rd ED. Mc Graw Hill, 2012
18. Renal Disease Techniques and Protocols, Goligorsky, Michael. S, Humana Press, 2003
19. Renal and Electrolyte Disorders, Schrier, Robert. W, 7th ED. Lippincott, 2010

20. Acid-Base Disorder and their Treatment, Gennari, John F (Et al), Taylor & Francis, 2005
21. Primer on Kidney Diseases, Greenberg, Arthur, 5th ED. Saunders, 2009
23. The Kidney, Brenner & Rector - 8th ED. Saunders, 2008
24. Critical Care Nephrology, C. Roncu – 2nd ED. Saunders, 2009.
25. Oxford desk Reference Nephrology, Jonathan Barratt, Kevin Harris, Peter Topham, 1st Indian ED, 2009.

JOURNALS

International

1. Transplantation
2. Kidney International
3. Hemodialysis International
4. Clinical Journal of the American Society of Nephrology

Indian

1. Indian Journal of Nephrology

Online Journals

1. BMC Nephrology
2. Clinical and Experimental Nephrology
3. International Urology and Nephrology
4. Journal of Artificial Organs
5. Hong Kong Journal of Nephrology
6. Clinical Queries: Nephrology
7. Journal of American Society of Hypertension
8. Journal of Cardiothoracic- Renal research
9. Indian Journal of Transplantation
10. Pediatric Nephrology

Fellowship Programme in Nephrology

Fellowship Programme in Surgical Oncology

Selection Criteria:

- Based on MBBS marks, Post Graduate marks & Interview marks
- Interested candidates should send in their application along with their CV, photocopy of MBBS & Post Graduate marks statement and State Medical Council Registration number.
- Interview dates will be announced after receipt of application and the candidate will be called and informed from the University.

Course:

- Full time Residential

Duration:

- 23 months

Fees:

- Tuition Fees: Rs 10 lakhs per annum
- Hostel & Other charges: Rs 2.5 lakhs per annum (5% extra in the 2nd Year)

Stipend:

- 1st Year - Rs 40,000 per month
- 2nd Year - Rs 45,000 per month

For further details contact: Controller of Examination – 9886313233

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