



स्वास्थ्य एवं परिवार कल्याण मंत्रालय के तहत सांविधिक निकाय  
Statutory Body under the Ministry of Health & Family Welfare

**F.No. 11-1/2024-INC (VII)**

**Dated: 23 OCT 2024**

**Draft Notification of Nurse Practitioner in Nephrology Nursing (NPnepN)-  
Postgraduate Residency Program 2024**

General Public is hereby informed that the Indian Nursing Council has drafted “**Nurse Practitioner in Nephrology Nursing (NPnepN)-Postgraduate Residency Program**” Accordingly, draft notification has been prepared and is attached for comments of the General Public/Stakeholders. Comments may be furnished via email [secy.inc@gov.in](mailto:secy.inc@gov.in) within 15 (Fifteen) days of uploading of this notice.

Yours faithfully,

**Encl: As above**

**Lt Col (Dr) Sarvjeet Kaur  
Secretary, INC**

**THE GAZETTE OF INDIA EXTRAORDINARY**  
**PART III—SECTION 4**  
**PUBLISHED BY AUTHORITY**  
**(TO BE GAZETTED)**

**INDIAN NURSING COUNCIL**  
**8<sup>th</sup> Floor, NBCC Centre, Plot No. 2, Community Centre**  
**Okhla Phase-1, New Delhi-110020**

**NOTIFICATION**

New Delhi, Dated \_\_\_\_\_, 2024

**INDIAN NURSING COUNCIL {NURSE PRACTITIONER IN NEPHROLOGY NURSING (NPNepN) -  
POSTGRADUATE RESIDENCY PROGRAM} REGULATIONS, 2024**

**F.No. 11-1/2024-INC (X):**—In exercise of the powers conferred by sub-section (1) of Section 16 of Indian Nursing Council Act, 1947 (XLVIII of 1947), as amended from time to time, the Indian Nursing Council hereby makes the following regulations, namely:—

**1. SHORT TITLE AND COMMENCEMENT**

- i. These Regulations may be called the **Indian Nursing Council {Nurse Practitioner in Nephrology Nursing (NPNepN) - Postgraduate Residency Program} Regulations, 2024**.
- ii. These shall come into force on the date of notification of the same in the Official Gazette of India.

**2. DEFINITIONS**

In these Regulations, unless the context otherwise requires,

- i. 'the Act' means the Indian Nursing Council Act, 1947 (XLVIII of 1947) as amended from time to time;
- ii. 'the Council' means the Indian Nursing Council constituted under the Act;
- iii. 'SNRC' means the State Nurse and Midwives Registration Council, by whichever name constituted, by the respective State Governments;
- iv. 'RN & RM' means a Registered Nurse and Registered Midwife (RN & RM) and denotes a nurse who has completed successfully, recognised Bachelor of Nursing (B.Sc. Nursing) or Diploma in General Nursing and Midwifery (GNM) course, as prescribed by the Council and is registered in a SNRC as Registered Nurse and Registered Midwife;
- v. 'Nurses Registration & Tracking System (NRTS)' means a system developed by the Council and software developed in association with National Informatics Centre (NIC), Government of India, and hosted by NIC for the purpose of maintenance and operation of the Indian Nurses Register. It has standardised forms for collection of the data of Registered Nurse and Registered Midwife (RN & RM)/Registered Auxiliary Nurse Midwife (RANM)/Registered Lady Health Visitor (RLHV) upon Aadhar based biometric authentication;
- vi. 'NUID' is the Nurses Unique Identification Number given to the registrants in the NRTS system;
- vii. 'General Nursing and Midwifery (GNM)' means Diploma in General Nursing and Midwifery qualification recognized by the Council under Section 10 of the Act and included in Part-I of the Schedule of the Act.

**NURSE PRACTITIONER IN NEPHROLOGY NURSING (NPNepN) -  
POSTGRADUATE RESIDENCY PROGRAM**

**I. Introduction and Background**

In India, reshaping health systems in all dimensions of health has been recognized as an important need in the National Health Policy, 2017 (NHP 2017). It emphasizes human resource development in the areas of education and training alongside regulation and legislation. The government recognizes significant expansion in tertiary care services both in public and private health sectors. In building their capacity, it is highly significant that the health care professionals require advanced educational preparation in specialty and super-specialty services. To support specialized and super-specialized health care services, specialist nurses with advanced preparation are essential. Developing training programs and curriculum in the area of tertiary care is recognized as the need of the hour. Nurse Practitioners (NPs) will be able to meet this demand provided they are well trained and empowered to practice. With establishment of new cadres in the Center and State level, master level prepared Nurse Practitioners

will be able to provide cost effective, competent, safe and quality driven specialized nursing care to patients in a variety of critical care settings in tertiary care centers. Nurse practitioners have been prepared and functioning in USA and Canada since 1960s, UK since 1980s, Australia since 1990s and Netherlands since 2010.

Nurse practitioners in critical care/acute care, oncology, nephrology care, emergency care, neuro care, cardiovascular care, anesthesia care and other specialties can be prepared to function in secondary and tertiary care settings. A curricular structure/framework is proposed by the Council towards preparation of Nurse Practitioner in Nephrology Nursing (NPNepN) at Masters' Level. The special feature of this program is that it is a clinical residency program emphasizing a strong clinical component with 15% of theoretical instruction and 85% of practicum. Competency based training is the major approach and NP education is based on competencies adapted from International Council of Nurses (ICN, 2020), American Association of Colleges of Nursing (AACN, 2021), American Nephrology Nurses Association (ANNA, 2020) and National Organization of Nurse Practitioner Faculties competencies, (NONPF competencies, 2022). Every course is based on achievement of competencies.

Nurse Practitioner in Nephrology Nursing program is intended to prepare registered B.Sc. Nurses to provide advanced nursing care to patients at tertiary care centers who have kidney diseases. A Nurse Practitioner in Nephrology Nursing (NPNepN) provides primary care to patients with acute or chronic kidney/urologic disorders, those undergoing dialysis, and those who are candidates for or have undergone kidney transplants.

The nursing care is focused on delaying disease progress, initiating early management, minimizing complications and optimizing quality of life. The program consists of various courses of study that are based on strong scientific foundations and evidence based practice in assessment and management of individuals with kidney diseases. These are built upon the theoretical and practice competencies of B.Sc. trained nurses. On completion of the program and registration with respective SNRC, they are permitted to practice all competencies listed in the log book of the Council syllabus and also independently administer drugs and order diagnostic tests, procedures and therapies as per institutional protocols/standing orders. The NPs in Nephrology Nursing when exercising this authority are accountable for the competencies in:

- a) Assessment and clinical examination
- b) Problem identification and preparation of treatment plan
- c) Planning and providing Hemodialysis and Peritoneal Dialysis
- d) Preparing patients and families for Kidney Replacement Therapy
- e) Preparing clients and their families for organ donation
- f) Selection/administration of medication or devices or therapies
- g) Patients' education
- h) Knowledge of interactions of therapeutics
- i) Evaluation of outcomes
- j) Recognition and management of complications and adverse reactions
- k) Contribution towards evidence based innovations in clinical practice
- l) Participation in Government and nongovernmental activities in promoting kidney donation and transplantation.

The Nurse Practitioner in Nephrology Nursing (NPNepN) is prepared and qualified to assume responsibility and accountability for the care of patients with kidney diseases under his/her care.

The said postgraduate degree will be registered as an additional qualification by the SNRC.

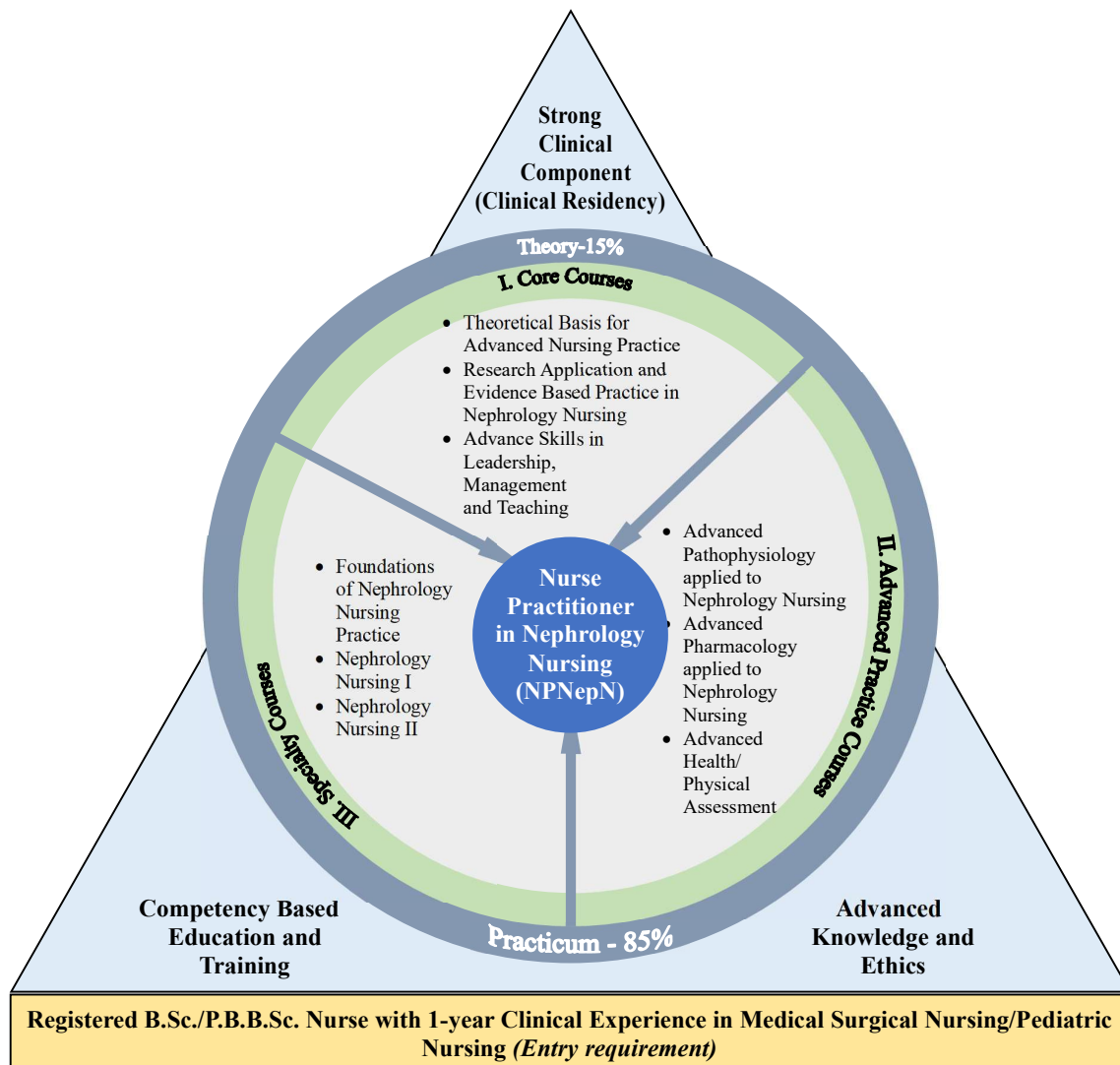
### **Philosophy**

The Council believes that there is a great need to establish a postgraduate program titled Nurse Practitioner in Nephrology Nursing (NPNepN) to meet the challenges and demands of tertiary health care services in India, which is reflected in the National Health Policy, 2017 and provide quality care to patients with kidney diseases and their families.

The Council believes that postgraduates from a residency program focused on strong clinical component and competency based training will be able to demonstrate clinical competence based on sound theoretical and evidence based knowledge. The teaching learning approach should focus on adult learning principles, competency based education, collaborative learning, preceptor guided clinical learning, experiential learning and self-directed learning. Education providers/preceptors/mentors must update their current knowledge and practices. Medical faculty are invited to participate as preceptors in the training.

The Council also believes that a variety of educational strategies can be used in the clinical settings to address the deficit of qualified nephrology nursing faculty. It is hoped to facilitate developing policies towards registration/licensure and create cadre positions for appropriate placement of these postgraduate NPNepN to function in secondary and tertiary care hospital settings or community health care settings that offer nephrology services. They may provide services also in chronic kidney disease clinics/centers, dialysis centers and primary care settings including home based hemodialysis and peritoneal dialysis.

An educational framework for the NP curriculum is proposed (See **Figure 1**)



**Figure 1. Nurse Practitioner in Nephrology Nursing (NPnepN) - An Educational Curricular Framework**

## II. Program Description

The Nurse Practitioner in Nephrology Nursing (NPnepN) program is a Nursing residency program with a main focus on Competency based training. The duration is of two years with the curriculum consisting of theory that includes core courses, advanced practice courses and clinical courses besides clinical practicum which is a major component (Refer Curricular framework).

This program is designed to assist the NP students in developing expertise and in depth understanding in the field of nephrology nursing. It will help them to develop advanced skills for nursing interventions while taking care of patients with kidney diseases.

## III. Aim

The NPnepN program prepares registered B.Sc. nurses for advanced practice roles as clinical experts, managers, educators and consultants leading to M.Sc. degree - Nurse Practitioner in Nephrology Nursing.

## IV. Objectives

On completion of the program, the NPnepN will be able to:

1. assume responsibility and accountability to provide competent family centered care to patients with kidney diseases-in various health care settings.
2. demonstrate clinical competence including expertise in clinical assessment of patients with varied kidney disorders, education, diagnostic reasoning, complex monitoring, and therapies including diet and liaising with resource agencies.

3. apply clinical knowledge, scientific principles, critical thinking skills and evidence base to implementing therapies/interventions in nephrology nursing.
4. participate in treating patients with kidney diseases to stabilize and restore patient's health and minimize or manage complications independently or collaboratively as a part of Nephrology team
5. collaborate with other health care professionals in the nephrology team, across the continuum of care.

#### **V. Minimum requirements to start the Nurse Practitioner in Nephrology Nursing (NPnepN) program**

The institution must accept the accountability for the NPnepN program and its students and offer the program congruent with the Council standards. It must fulfill the following requirements:

##### *1. Essentiality Certificate*

- a. Any institution who wishes to start Nurse Practitioner in Nephrology Nursing (NPnepN) program shall obtain an Essentiality Certificate/Government Order from the State.
- b. The following institutions are exempted from obtaining Essentiality Certificate
  - i. Institutions/Universities already offering B.Sc. Nursing or M.Sc. Nursing programs and found suitable by the Council under Sections 13 and 14 of the Act;
  - ii. Institutions/Universities offering MBBS/DNB programs.

##### *2. Hospital*

- a. The institute should have a parent hospital/tertiary care centre with a minimum of 200 beds.
- b. It is preferable to have a medical college/nursing college attached to the parent hospital.

##### *3. Nephrology Beds*

The hospital should have at-least one nephrology ward with minimum of 20 beds, a hemodialysis unit with minimum 10 beds and scope for Kidney transplant services. It is preferable to have a peritoneal Dialysis unit with a minimum of 2 beds.

##### *4. Nephrology Unit staffing*

- a. The ward and Dialysis Unit should have a Charge Nurse preferably with B.Sc. Nursing or M.Sc. Nursing qualification.
- b. The nurse patient ratio should be 1:6 for every shift in the general ward.
- c. For the Dialysis unit, the nurse patient ratio should be 1:1 for every shift.
- d. Provision of additional 45% staff towards leave reserve.

##### *5. Faculty/Staff resources*

###### **a. Clinical area:**

*Nursing Preceptor* – Full-time qualified GNM with 6 years of experience in nephrology nursing (preferably with Post Basic Diploma in Renal Nursing) or B.Sc. Nursing with 2 years of experience in Nephrology Nursing or M.Sc. (Specialty-Medical Surgical Nursing) with one year experience in Nephrology Nursing.

*Medical Preceptor:* DM in Nephrology

*Preceptor student ratio:* Nursing 1:10, Medical 1:10 (Every student must have a medical and nursing preceptor)

###### **b. Teaching faculty:**

- a. Professor/Associate professor: 1 {Teaching experience: 5 years post PG-M.Sc. (Specialty-Medical Surgical Nursing)} with faculty student ratio of 1:10.
- b. Assistant professor: 1 (Teaching experience: 3 years post B.Sc.).
- c. The above faculty shall perform dual role or be a senior nurse with M.Sc. Nursing qualification employed in nephrology unit.
- d. Guest Lecturers for Pharmacology, Pathophysiology.

##### *6. Physical and learning resources at hospital/college*

- a. One classroom/conference room at the clinical area
- b. Skill Lab for simulated learning (hospital/college)
- c. Library and computer facilities with access to online journals
- d. E-Learning facilities

##### *7. List of equipment (enclosed in Appendix-1).*

8. *Student Recruitment/Admission Requirements*

- a. Applicants must possess a registered B.Sc./P.B.B.Sc. nurse with a minimum of one year clinical experience, preferably in any Nephrology care setting prior to enrollment.
- b. Must have undergone the B.Sc./P.B.B.Sc. in an institution recognized by the Council.
- c. Must have scored not less than 55% aggregate marks in the B.Sc. nursing program.
- d. Selection must be based on the merit of an entrance examination and interview held by the competent authority.
- e. Must be physically fit.

*Number of candidates:* 1 candidate for 3 dialysis beds and 5 in-patients in nephrology.

**Salary**

1. In-service candidates will get regular salary.
2. Stipend/Salary for the other candidates as per the salary structure of the hospital where the course is conducted.

**VI. Examination Regulations**

*Eligibility for appearing for the Examination*

*Attendance:* Minimum 80% for theory and practical before appearing for final University examination but must complete 100% in practical before the award of degree.

There is no minimum cut off for internal assessment marks, as internal and external marks are added together for declaring pass.

*Examining and Degree Awarding Authority:* Respective University.

*Declaration of Results*

The candidate is declared to have passed the exam if the score is 60% and above. This score is the aggregate of both internal and external University examination in theory and practical in every course/subject and less than 60% is fail.

For calculating the rank, the aggregate of the two years' marks will be considered.

If a candidate fails in theory or practical, he/she must appear for the paper in which he/she has failed.

Rank will not be declared for candidates who fail in any subject.

Maximum period to complete the program is 4 years.

*Practical examination*

OSCE type of examination is to be conducted alongside viva (oral examination) - Refer OSCE Guidelines found in **Appendix-2**.

Maximum number of students for practical exam per day = 10 students.

Examination should be held in clinical area only.

The team of practical examiners will include one internal examiner {(M.Sc. Nursing faculty with two years of experience in teaching the NPNepN program/M.Sc. Nursing faculty (Medical Surgical Nursing) with 5 years of post PG experience}, one external examiner (same as above) and one medical internal examiner who should be the preceptor for NPNepN program.

*Dissertation\**

*Research Guides:* Main guide: Nursing faculty (3 years Post PG experience) teaching NPNepN program, Co-guide: Medical preceptor.

*Submission of Research Proposal:* 6-9 months after date of admission in the first year.

*Guide Student Ratio:* 1:5

*Research Committee:* There shall be a separate research committee in the college/hospital to guide and oversee the progress of the research (minimum of 5 members with Principal or CNO who is M.Sc. Nursing qualified).

*Ethical Clearance* must be obtained by the Institutional Review Board/Hospital Ethics Committee since it involves clinical research.

*Topic Selection:* The topic should be relevant to Nephrology Nursing that will add knowledge or evidence for nursing intervention. The research should be conducted in any of the Nephrology care settings.

*Data Collection:* 7 weeks are allotted for data collection, which can be integrated during clinical experience after 6 months in first year and before 6 months in second year.

*Writing the Research Report:* 6-9 months in second year.

*Submission of Dissertation Final:* 3 months before completion of the second year.

### Dissertation Examination

*Internal Assessment:* Viva & Dissertation Report = 50 marks.

*University Examination:* Viva & Dissertation Report = 50 marks.

(Marking guide used for other M.Sc. Nursing specialties can be used for evaluation.)

\*EBP project may be conducted in place of dissertation and report submitted for evaluation.

### VII. Assessment (Formative and Summative)

- Quiz
- Seminar
- Written assignments
- Case/Clinical presentation
- Clinical or care pathway/Case study report
- Clinical performance appraisal
- Log Book: Procedural competency and completion of clinical requirements signed by the medical/nursing faculty/preceptor
- Objective Structured Clinical Examination (OSCE)
- Test papers, Quiz
- Final examination

(Refer **Appendix-2** for Assessment Guidelines)

### Scheme of Final Examination

S.No.	Title	Theory %			Practical %		
		Hours	Internal	External	Hours	Internal	External
<b>I<sup>st</sup> year</b>							
<b>Core Courses</b>							
1	Theoretical Basis for Advanced Practice Nursing	2	50				
2	Research Application and Evidence Based Practice in Nephrology Nursing	3	30	70			
3	Advanced Skills in Leadership, Management and Teaching	3	30	70			
<b>Advanced Practice Courses</b>							
4	Advanced Pathophysiology & Advanced Pharmacology applied to Nephrology Nursing	3	30	70			
5	Advanced Health/Physical Assessment	3	30	70		50	50
<b>II<sup>nd</sup> year</b>							
<b>Specialty Courses</b>							
1	Foundations of Nephrology Nursing Practice	3	30	70		100	100
2	Nephrology Nursing I	3	30	70		100	100
3	Nephrology Nursing II	3	30	70		100	100
4	Dissertation and viva					50	50

### VIII. Courses of Instruction

S.No.	Title	Theory (hours)	Lab/Skill Lab (hours)	Clinical (hours)
<b>I<sup>st</sup> year</b>				
<b>Core Courses</b>				
I	Theoretical Basis for Advanced Practice Nursing	40		

S.No.	Title	Theory (hours)	Lab/Skill Lab (hours)	Clinical (hours)
II	Research Application and Evidence Based Practice in Nephrology Nursing	56	24	<b>336</b> (7 weeks)
III	Advanced Skills in Leadership, Management and Teaching	56	24	<b>192</b> (4 weeks)
<b>Advanced Practice Courses</b>				
IV	Advanced Pathophysiology applied to Nephrology Nursing	60		<b>336</b> (7 weeks)
V	Advanced Pharmacology applied to Nephrology Nursing	54		<b>336</b> (7 weeks)
VI	Advanced Health/Physical Assessment	70	48	<b>576</b> (12 weeks)
TOTAL = 2208 hours		<b>336</b> (7 weeks)	<b>96</b> (2 weeks)	<b>1776</b> (37 weeks)
<b>II<sup>nd</sup> year</b>				
<b>Specialty Courses</b>				
VII	Foundations of Nephrology Nursing Practice	96	48	<b>576</b> (12 weeks)
VIII	Nephrology Nursing I	96	48	<b>576</b> (12 weeks)
IX	Nephrology Nursing II	96	48	<b>624</b> (13 weeks)
TOTAL = 2208 hours		<b>288</b> (6 weeks)	<b>144</b> (3 weeks)	<b>1776</b> (37 weeks)

Number of weeks available in a year = 52 - 6 (Annual leave, Casual leave, Sick leave = 6 weeks) = 46 weeks × 48 hours = 2208 hours

Two years = 4416 hours (Examination during clinical posting)

**Instructional hours:** Theory = 624 hours, Skill Lab = 240 hours, Clinical = 3552 hours

TOTAL = 4416 hours

I<sup>st</sup> year: 336-96-1776 hours (Theory-Practicum) [Theory = 15%, Practicum = 85%]

II<sup>nd</sup> year : 288-144-1776 hours (Theory-Practicum) [Theory = 15%, Practicum = 85%]

I<sup>st</sup> year = 46 weeks/2208 hours (46×48 hours) (Theory + Lab: 7.5 hours per week for 44 weeks = 330/336+96 hours\*)

\*Theory + Lab = 96 hours can be given for 2 weeks in the form of introductory block classes and workshops

II<sup>nd</sup> year = 46 weeks/2208 hours (46×48 hours) (Theory + Lab: 8.5 hours per week for 45 weeks = 384+48 hours) (1 week Block Classes = 48 hours)

## CLINICAL PRACTICE

**A. Clinical Residency Experience** (A minimum of 48 hours per week is prescribed, however, it is flexible with different shifts and OFF followed by ON CALL duty)

**B. 8 hours duty with one day OFF in a week and ON CALL duty once per week.**

### Clinical Placements

**I<sup>st</sup> year: 44 weeks** (excludes 2 weeks of introductory block classes and workshop)

- Adult Nephrology ward - 10 weeks
- Pediatric Nephrology ward - 4 weeks
- Dialysis Unit - 14 weeks
- Urology ward - 2 weeks
- Renal Transplant Unit - 5 weeks



- Nephrology OPD - 4 weeks (including transplant OPD)
- Medical ICU - 4 weeks
- Organ Donation Unit/NOTO - 1 week

**II<sup>nd</sup> year: 45 weeks** (excludes one week of block classes)

- Medical ICU - 4 weeks
- Surgical ICU - 2 weeks
- Pediatric ICU - 2 weeks
- Adult Nephrology Ward - 8 weeks
- Pediatric Nephrology Ward - 2 weeks
- Nephrology OPD - 6 weeks
- Dialysis Unit - 10 weeks (includes PD)
- Kidney Transplant Unit - 5 weeks
- Operation Theatre - 4 weeks
- Urology ward - 2 weeks

### C. Teaching/Learning methods

Learning will be faculty facilitated self-directed, integrated with clinical experience.

- Experiential learning
- Reflective learning
- Simulation based learning
- Clinical conference
- Case/clinical presentation
- In depth drug study, presentation and report
- Nursing rounds
- E-learning, narrated presentations
- Flipped classroom
- Clinical seminars
- Journal clubs
- Case study/Clinical or care pathway
- Advanced health assessment
- Faculty lecture in the clinical area
- Directed reading
- Demonstrations, Supervised skill practice
- Assignments
- Case study analysis
- Workshops
- Observation of procedures
- Demonstration and supervised skill practice

### D. Procedures/Log Book

At the end of each Clinical Posting, Clinical Log Book (Specific Procedural Competencies/Clinical Skills) (**Appendix-3**) and Clinical Requirements (**Appendix-4**) have to be signed by the preceptor/faculty every fortnight.

### E. Nurse Practitioner in Nephrology Nursing Competencies (Adapted from ICN, 2020)

1. Uses advanced comprehensive assessment, diagnosis, treatment planning, implementation, and evaluation skills.
2. Applies and adapts advanced skills in complex and/or unstable environments.
3. Applies sound advanced clinical reasoning and decision making to inform, guide and teach in practice.
4. Documents assessment, diagnosis, management and monitors treatment and follow-up care in partnership with the patient.
5. Administer drugs and treatments according to institutional protocols.
6. Uses applicable communication, counseling, advocacy and interpersonal skills to initiate, develop and discontinue therapeutic relationships.
7. Refers to and accepts referrals from other health care professionals to maintain continuity of care.
8. Practices independently where authorized and the regulatory framework allows in the interest of the patients, families and communities.
9. Consults with and is consulted by other health care professionals and others.
10. Works in collaboration with health team members in the interest of the patient.

11. Develops a practice that is based on current scientific evidence and incorporated into the health management of patients, families and communities.
12. Initiates, evaluates and manages evidence based practice.
13. Uses research to produce evidence based practice to improve the safety, efficiency and effectiveness of care through independent and inter-professional research.
14. Engages in ethical practice in all aspects of the APN role and responsibility.
15. Accepts accountability and responsibility for own advanced professional judgement, actions, and continued competence.
16. Creates and maintains a safe therapeutic environment through the use of risk management strategies and quality improvement.
17. Assumes leadership and management responsibilities in the delivery of efficient advanced practice nursing services in a changing health care system.
18. Acts as an advocate for patients in the health care systems and the development of health policies that promote and protect the individual patient, family and community.
19. Adapts practice to the contextual and cultural milieu.

#### **Core Competencies of ANNA (2020)**

1. Advanced knowledge in nephrology that includes pathophysiology and management of kidney/urologic conditions and their complications.
2. Excellent interpersonal, communication, and critical thinking skills.
3. Advanced clinical skills in assessment, diagnosis and management of patients with kidney disorders that include kidney replacement therapy.
4. Sensitivity to the needs of patients and their families as they deal with kidney diseases and its impact.
5. Ability to teach patients about kidney diseases, treatment, and life style changes.
6. Ability to deal with grief and loss that can be associated with kidney disease.
7. Ability to work in a multidisciplinary team in care coordination.

#### **F. Institutional Protocol/Standing Orders based administration of drugs & ordering of investigations and therapies**

The students will be trained to independently administer drugs and order diagnostic tests, procedures, medical equipment and therapies as per institutional protocols/standing orders. (**Appendix-5** Standing Orders). Administration of emergency drugs is carried out in consultation with concerned physician and endorsed later by written orders.

#### **Implementation of Curriculum - A Tentative Plan**

<b>1<sup>st</sup> year Courses</b>	<b>Introductory Classes</b>	<b>Workshop</b>	<b>Theory integrated into Clinical Practicum</b>	<b>Methods of Teaching (Topic can be specified)</b>
1. Theoretical Basis for Advanced Practice Nursing (40)	8 hours		1×32 = 32 hours	<ul style="list-style-type: none"> <li>• Seminar/Theory Application</li> <li>• Lecture (Faculty)</li> <li>• Journal Presentation</li> <li>• Flipped Classroom</li> </ul>
2. Research Application and Evidence Based Practice in Nephrology Nursing (56+24)	8 hours	40 (5 days) + 8 hours	1×24 = 24 hours	<ul style="list-style-type: none"> <li>• Research Study Analysis</li> <li>• Exercise/Assignment (Lab)</li> </ul>
3. Advanced Skills in Leadership, Management and Teaching (56+24)	4 hours	16 hours (2 days)	1×26 = 26 hours 2×16 = 32 hours	<ul style="list-style-type: none"> <li>• Clinical Conference</li> <li>• Seminar, Practice Teaching</li> <li>• Workshop</li> <li>• Exercises/Assignment (Lab)</li> </ul>
4. Advanced Pathophysiology applied to Nephrology Nursing (60)			1.5×40 = 60 hours	<ul style="list-style-type: none"> <li>• Case Presentation</li> <li>• Seminar</li> <li>• Clinical Conference</li> <li>• Concept Mapping</li> </ul>

<b>I<sup>st</sup> year Courses</b>	<b>Introductory Classes</b>	<b>Workshop</b>	<b>Theory integrated into Clinical Practicum</b>	<b>Methods of Teaching (Topic can be specified)</b>
5. Advanced Pharmacology applied to Nephrology Nursing (54)	10 hours		1×44 = 44 hours	<ul style="list-style-type: none"> <li>• Nursing Rounds</li> <li>• Drug Study Presentation</li> <li>• Standing Orders</li> <li>• Lecture/Discussions</li> <li>• Drug Diary</li> </ul>
6. Advanced Health/ Physical Assessment (70+48)	8 hours		2×26 = 52 hours 1.5×18 = 27 hours 1×15 = 15 hours 2×6 = 12 hours 2×2 = 4 hours	<ul style="list-style-type: none"> <li>• Clinical Demonstration (Faculty)</li> <li>• Return Demonstration</li> <li>• Nursing Rounds</li> <li>• Physical Assessment (all systems)</li> <li>• Case Study</li> </ul>
<b>TOTAL</b>	<b>48 hours</b>	<b>48 hours</b>	<b>336 hours</b>	

I<sup>st</sup> year - Introductory classes = 1 week (48 hours), Workshop = 1 week (48 hours), 44 weeks = 7.5 hours per week (330/336 hours)

<b>II<sup>nd</sup> year Courses 1 week Block Classes (48 hours)</b>	<b>Theory and Skill Lab integrated into Clinical Practicum</b>	<b>Methods of Teaching</b>
1. Foundations of Nephrology Nursing Practice (96+48 hours) = 144 hours	9×16 = 144 hours	<ul style="list-style-type: none"> <li>• Demonstration</li> <li>• Supervised Practice</li> <li>• Clinical Teaching</li> <li>• Case Study</li> <li>• Seminar</li> <li>• Clinical Conference</li> <li>• Faculty Lecture</li> </ul>
2. Nephrology Nursing I (96+48 hours) = 144 hours	9×16 = 144 hours	<ul style="list-style-type: none"> <li>• Demonstration</li> <li>• Supervised Practice</li> <li>• Clinical Conference/Journal Club</li> <li>• Flipped Classroom</li> <li>• Seminar</li> <li>• Case Presentation</li> <li>• Drug Study (including Drug Interaction)</li> <li>• Nursing Rounds</li> <li>• Faculty Lecture</li> <li>• Reflective Learning</li> <li>• Narrated PPT, Video</li> <li>• Directed Reading</li> </ul>
3. Nephrology Nursing II (96+48 hours) = 144 hours	9×16 = 144 hours	<ul style="list-style-type: none"> <li>• Demonstration (Lab)</li> <li>• Supervised Practice of Clinical Skills</li> <li>• Nursing Rounds</li> <li>• Clinical Conference/Journal Club</li> <li>• Seminar, Case Studies</li> <li>• Faculty Lecture</li> <li>• Reflective Learning</li> <li>• Directed Reading, Literature Review</li> </ul>

II<sup>nd</sup> year: Block classes - 1 week, 45 weeks - 8.5/9 hours per week

Topic for every teaching method will be specified in the detailed plan by the respective teacher/institution concerned.

## CORE COURSES

### I. Theoretical Basis for Advanced Practice Nursing

#### COMPETENCIES

1. Analyses the global health care trends and challenges.
2. Analyses the impact of health care and education policies in India on nursing consulting the documents available.
3. Develops in depth understanding of the health care delivery system in India, and its challenges.
4. Applies economic principles relevant to delivery of health care services in critical care.
5. Manages and transforms health information to effect health outcomes such as cost, quality and satisfaction.
6. Accepts the accountability and responsibility in practicing the Nurse Practitioner's roles and competencies.
7. Actively participates in collaborative practice involving all health care team members in critical care and performs the prescriptive roles within the authorized scope.
8. Engages in ethical practice having a sound knowledge of law, ethics and regulation of advanced nursing practice.
9. Uses the training opportunities provided through well planned preceptorship and performs safe and competent care applying nursing process/care pathways or clinical pathways.
10. Applies the knowledge of nursing theories in providing competent care to patients with kidney disorders.
11. Predicts future challenges of Nurse Practitioner's roles in variety of health care settings particularly in India.

#### Hours of Instruction: Theory: 40 hours

S.No.	Topic	Hours
1.	Global Health Care Challenges and Trends (Competency-1)	2
2.	Health System in India Health Care Delivery System in India - Changing Scenario (Competency-3)	2
3.	National Health Planning - 5-Year Plans and National Health Policy (Competency-2)	2
4.	Health Economics & Health Care Financing (Competency-4)	4
5.	Health Information System including Nursing Informatics (Use of Computers) (Competency-5)	4
<b>Advanced Practice Nursing (APN)</b>		
6.	APN - Definition, Scope, Philosophy, Accountability, Roles & Responsibilities (Collaborative Practice and Nurse Prescribing Roles) (Competency-6&7)	3
7.	Regulation (Accreditation of Training Institutions and Credentialing) & Ethical Dimensions of Advanced Nursing Practice Role (Competency-8)	3
8.	Nurse Practitioner - Roles, Types, Competencies, Clinical Settings for Practice, Cultural Competence (Competency-6)	3
9.	Training for NPs - Preceptorship (Competency-9)	2
10.	Future Challenges of NP Practice (Competency-11)	4
11.	Theories of Nursing applied to APN (Competency-10)	3
12.	Nursing Process/Care Pathway applied to APN (Competency-9)	2
<b>Self-Learning Assignments</b>		6
1.	Identify Health Care and Education Policies and analyze its impact on Nursing	
2.	Describe the legal position in India for NP practice. What is the future of nurse prescribing policies in India with relevance to these policies in other countries?	
3.	Examine the nursing protocols relevant to NP practice found in nephrology unit/kidney transplant unit/dialysis unit in your tertiary center	
<b>Total</b>		<b>40 hours</b>

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- AACN (2021) The essentials: Core Competencies for Professional Nursing Education - Entry Level and Advanced Level Nursing Education, American Association of Colleges of Nursing
- ANNA (2021) The Nephrology Nurses Scope and Standards of Practice: Standards of Professional Performance and Competencies, Nephrol Nurs J. 2022 Jul-Aug.
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- Hickey J.V., Ouimette R.M. & Venegoni S.L. (1996) *Advanced Practice Nursing: Changing Roles and Clinical Applications*, Philadelphia: Lippincott Williams & Wilkins
- ICN (2020) *Guidelines on Advanced Practice Nursing*, Geneva: ICN
- NONPF (2022) *Nurse Practitioner Role Competencies*, National Organization of Nurse Practitioner Faculties
- Schober M. & Affara F.A. (2006) *Advanced Nursing Practice*, Oxford: Blackwell Publishing
- Stewart G.J. & DeNisco S.M. (2015) *Role Development for the Nurse Practitioner*, USA: Springer Publishing Company

## II. Research Application and Evidence Based Practice in Nephrology Nursing

### COMPETENCIES

1. Applies sound research knowledge and skills in conducting independent research in Nephrology care setting.
2. Participates in collaborative research to improve patient care quality.
3. Interprets and uses research findings in advanced practice to produce EBP.
4. Tests/evaluates current practice to develop best practices and health outcomes and quality care in advanced practice.
5. Analyzes the evidence for nursing interventions carried out in Nephrology Nursing practice to promote safety and effectiveness of care.
6. Develops skill in writing scientific research reports.

**Hours of Instruction: Theory: 56 hours + Lab/Skill Lab: 24 hours = 80 hours**

S.No.	Topic	Hours
1	<i>Research and Advanced Practice Nursing:</i> Significance of research and inquiry related to advanced nursing role (Competency-1)	2
2	<i>Research Agenda for APN Practice:</i> Testing current practice to develop best practice, health outcomes and indicators of quality care in advanced practice (Competency-3,4,5), promoting research culture	5
3	<i>Research Knowledge and Skills:</i> Research competencies essential for APNs (interpretation and use of research, evaluation of practice, participation in collaborative research)  Introduction to Evidence Based Practice (EBP) project - PiCOT question, steps of planning, implementation, evaluation and dissemination (project proposal and project report)  <i>Research Methodology</i> Phases/steps  (Research question, review of literature, conceptual framework, research designs, sampling, data collection, methods & tools, Analysis and Reporting)  Writing research proposal and research report (Competency-1 & 2)	40 (5 days workshop)
4	<i>Writing for Publication</i> (Writing workshop - Manuscript preparation and finding funding sources) (Competency-6)	5 (workshop)
5	<i>Evidence Based Practice</i> - Concepts, principles, importance and steps - Integrating EBP to ICU environment - Areas of evidence in critical care - Barriers to implement EBP - Strategies to promote EBP (Competency-3,4,5)	4
<b>Total</b>		<b>56 hours</b>

### Practical Learning & Assignments: 24 hours

- Identifying research priorities
- Writing exercises on research question, objectives and hypothesis
- Prepare research proposal/EBP project proposal
- Data Collection, analysis and interpretation
- Scientific paper writing - preparation of manuscript for publication
- Literature review - analyze the evidence for specific clinical practices in nephrology setting.

## Practicum

- Dissertation (336 hours = 7 weeks)/Evidence Based Practice Project (EBP project)

## Bibliography

- Gray J. & Grove S.K. (2020) Burns & Groves' The Practice of Nursing Research: Appraisal, Synthesis and Generation of Evidence (9<sup>th</sup> ed.), St. Louis: Elsevier Saunders
- Polit D.F. & Beck C.T. (2021) Nursing Research: Generating and Assessing Evidence for Nursing Practice (11<sup>th</sup> ed.), New Delhi: Wolters & Kluwer
- Schmidt N.A. & Brown J.M. (2021) Evidence Based Practice for Nurses' Appraisal and Application of Research, Sd: Jones & Bartlett Publishers Inc.

## III. Advanced Skills in Leadership, Management and Teaching

### COMPETENCIES

1. Applies principles of leadership and management in Nephrology unit.
2. Manages stress and conflicts effectively in any Nephrology care setting using sound knowledge of principles.
3. Applies problem solving and decision-making skills effectively.
4. Uses critical thinking and communication skills in providing leadership and managing patients care in Nephrology care settings.
5. Builds teams and motivates others in Nephrology care settings.
6. Participates appropriately in times of innovation and change.
7. Uses effective teaching methods, media and evaluation based on sound principles of teaching.
8. Develops advocacy role in patient care, maintaining quality and ethics in care delivery.
9. Provides counseling to families and patients that facilitates shared decision making on treatment plans.

### Hours of Instruction: Theory: 56 hours + Lab/Skill Lab: 24 hours = 80 hours

S.No.	Topic	Hours
1.	Theories, styles of leadership and current trends	2
2.	Theories, styles of management and current trends	2
3.	Principles of leadership and management applied to Nephrology care settings	4
4.	Stress management and conflict management - principles and application, effective time management	4
5.	Quality improvement and audit	4
6.	Problem solving, critical thinking and decision making, communication skills applied to Nephrology nursing practice	5
7.	Team building, motivating and mentoring within Nephrology unit set up	2
8.	Budgeting and management of resources including human resources - material, manpower, time	5
9.	Change and innovation	2
10.	Performance indicators for practice and performance measures	6
11.	Teaching-learning theories and principles applied to Nephrology Nursing	2
12.	Competency based education and outcome based education	2
13.	Teaching methods/strategies, media: educating patients and staff in Nephrology care settings	8
14.	Staff education and use of tools in evaluation	4
15.	APN - Roles as a teacher	2
16.	Advocacy roles in Nephrology care environment	2
	<b>Total</b>	<b>56 hours</b>

### Practice = 24 hours

1. Preparation of staff patient assignment
2. Patient care audit
3. Preparation of nursing care standards and protocols
4. Monitoring, evaluation, and writing report of infection control practices
5. Development of teaching plan for staff and patients using appropriate, technology assisted teaching aids

6. Micro teaching/patient education sessions
7. Planning and conducting OSCE/OSPE
8. Quality Improvement Audit
9. Construction of tests
10. Performance indicators measurement

#### Assignment

- Prepare Nursing care standards for one of the Dialysis units

#### Bibliography

- Bastable S.B. (2019) Nurse as Educator: Principles of Teaching and Learning for Nursing Practice (5<sup>th</sup> ed.), New Delhi: Jones & Bartlett Publishers Inc.
- Billings D.M. & Halstead J.A. (2019) Teaching in Nursing: A Guide for Faculty (6<sup>th</sup> ed.), St. Louis, Missouri: Saunders Elsevier
- Clark C.C. (2010) Creative Nursing Leadership and Management, New Delhi: Jones & Bartlett Publishers Inc.
- Liebler J.G. & McConnel C.R. (2008) Management Principles for Health Professionals, Sudbury, M.A: Jones & Bartlett Publishers Inc.
- Roussel L. & Swansburg R.C. (2010) Management and Leadership for Nurse Administrators (5<sup>th</sup> ed.), New Delhi: Jones & Bartlett Publishers Inc.

### ADVANCED NURSING COURSES

#### IV. Advanced Pathophysiology applied to Nephrology Nursing

##### COMPETENCIES

1. Integrates the knowledge of pathophysiological process in kidney care in developing diagnosis and plan of care.
2. Applies the pathophysiological principles in symptom management and secondary prevention of complications related to kidney disease.
3. Analyzes the pathophysiological changes relevant to each condition requiring kidney transplant recognizing the value of diagnosis, treatment, care and prognosis.

#### IV.A. Advanced Pathophysiology applied to Nephrology Nursing

Hours of Instruction: Theory: 30 hours

Unit	Hours	Content
I	10	<b>Review of Anatomy and Physiology of Kidneys and Urinary system</b> <ul style="list-style-type: none"> <li>• Macroscopic structure of Kidney, Ureter, Bladder</li> <li>• Microscopic structure of Kidney</li> <li>• Physiology of Urine Formation               <ul style="list-style-type: none"> <li>○ Glomerular filtration</li> <li>○ Tubular Reabsorption</li> <li>○ Tubular secretion</li> </ul> </li> <li>• Renin Angiotensin Mechanism</li> <li>• Functions of Kidney, Ureter Bladder</li> </ul>
II	7	<b>Fluid and Electrolyte Regulation and Imbalances</b> <ul style="list-style-type: none"> <li>• Fluid Distribution in the body</li> <li>• Fluid regulation mechanisms in the body</li> <li>• Electrolyte distribution, Role of Electrolytes (Sodium, potassium, calcium, phosphorus, Magnesium)</li> <li>• Identifying and Managing Fluid and Electrolyte imbalances               <ul style="list-style-type: none"> <li>○ Water</li> <li>○ Sodium</li> <li>○ Potassium</li> <li>○ Phosphorous</li> <li>○ Calcium</li> <li>○ Magnesium</li> </ul> </li> </ul>
III	5	<b>Acid base Regulation and imbalances</b> <ul style="list-style-type: none"> <li>• Acid Base regulatory mechanisms in the body</li> <li>• Compensatory mechanism</li> </ul>

Unit	Hours	Content
		<ul style="list-style-type: none"> <li>• Effect of Acid Base balance in the body</li> <li>• Normal Values</li> <li>• Identifying Acid base imbalances</li> <li>• Interpretation of ABG analysis results</li> </ul>
IV	8	<b>Anatomy and Physiology of related systems</b> <ul style="list-style-type: none"> <li>• Cardiac physiology</li> <li>• Interpretation of ECG</li> <li>• Respiratory system</li> <li>• Endocrine system</li> <li>• Nervous system</li> </ul>
<b>Total</b>	<b>30 hours</b>	

#### IV.B. Advanced Physiology applied to Nephrology Nursing

Hours of Instruction: Theory: 30 hours

Unit	Hours	Content
I	5	<b>Hematological function</b> <ul style="list-style-type: none"> <li>• Composition of Blood</li> <li>• Types of blood cells</li> <li>• Formation of Blood cells</li> <li>• Blood Groups</li> <li>• Hematocrit</li> <li>• Clotting Mechanism</li> <li>• Common hematological problems in kidney disease</li> </ul>
II	3	<b>Integumentary function</b> <ul style="list-style-type: none"> <li>• Advanced pathophysiological process of integumentary conditions <ul style="list-style-type: none"> <li>○ Wound healing</li> <li>○ Burns</li> <li>○ Steven Johnson Syndrome</li> <li>○ Skin changes in Kidney Disorders</li> </ul> </li> </ul>
III	5	<b>Multisystem dysfunction</b> <ul style="list-style-type: none"> <li>• Shock <ul style="list-style-type: none"> <li>○ Hypovolemic</li> <li>○ Cardiogenic</li> <li>○ Distributive</li> </ul> </li> <li>• Systemic inflammatory syndrome</li> <li>• Multiple organ dysfunction syndrome</li> <li>• Sepsis</li> <li>• Drug overdose and poisoning</li> <li>• Envenomation</li> </ul>
IV	5	<b>Specific infections</b> <ul style="list-style-type: none"> <li>• Advanced pathophysiological process of specific infections <ul style="list-style-type: none"> <li>○ HIV</li> <li>○ Tetanus</li> <li>○ SARS, COVID</li> <li>○ Hepatitis A</li> <li>○ Hepatitis B</li> <li>○ Leptospirosis</li> <li>○ Dengue</li> <li>○ Malaria</li> <li>○ Tuberculosis</li> </ul> </li> </ul>
V	4	<b>Reproductive functions</b> <ul style="list-style-type: none"> <li>• Kidney Injury from: <ul style="list-style-type: none"> <li>○ Antepartum hemorrhage</li> <li>○ Pregnancy induced hypertension, Pre-eclampsia</li> <li>○ HELLP (Hemolysis, Elevated Liver enzymes, Low Platelet Count)</li> </ul> </li> </ul>



Unit	Hours	Content
		<ul style="list-style-type: none"> <li>○ Postpartum hemorrhage</li> <li>○ Puerperal sepsis</li> </ul>
VI	8	<b>Basic Immunology</b> <ul style="list-style-type: none"> <li>● Immunoglobulins</li> <li>● Antigen Antibody reactions</li> <li>● Cross matching</li> <li>● Cell mediated Immunity</li> <li>● Immediate and Delayed hypersensitivity</li> <li>● Autoimmunity</li> <li>● Transplant immunology</li> <li>● HLA Typing</li> </ul>
<b>Total</b>	<b>30 hours</b>	

### Bibliography

- Berkowitz A. (2021) Clinical Pathophysiology (2<sup>nd</sup> ed.), MedMaster Inc.
- Huether S.E., McCance K.L. & Brashers V.L. (2019) Understanding Pathophysiology (7<sup>th</sup> ed.), St. Louis, Missouri: Elsevier
- Norris T.L. (2020) Porth's Essentials of Pathophysiology (5<sup>th</sup> ed.), Walters & Kluwer
- Porth C.M. (2007) Essentials of Pathophysiology: Concepts of Altered Health States (4<sup>th</sup> ed.), Philadelphia: Lippincott Williams & Wilkins
- Story L. & Dugasch L. (2019) Advanced Pathophysiology for the Advanced Practice Nurse (1<sup>st</sup> ed.), Jones & Bartlett Publishers Inc.
- Willis L.M. (2019) Professional Guide to Pathophysiology (4<sup>th</sup> ed.), LWW

### V. Advanced Pharmacology applied to Nephrology Nursing

#### COMPETENCIES

1. Applies the pharmacological principles in providing care to patients with kidney disorders.
2. Analyzes pharmaco-therapeutics and pharmacodynamics relevant to drugs used in the treatment of nephrology conditions.
3. Performs safe drug administration based on principles and institutional protocols.
4. Documents accurately and provides follow up care.
5. Applies sound knowledge of drug interactions in administration of drugs to patients in the nephrology care settings and guiding their families in self-care management.

#### Hours of Instruction: Theory: 54 hours

Unit	Hours	Content
I	2	<b>Introduction to Pharmacology</b> <ul style="list-style-type: none"> <li>● History</li> <li>● Classification of drugs and schedules</li> </ul>
II	3	<b>Pharmacokinetics and Pharmaco-dynamics</b> <ul style="list-style-type: none"> <li>● Introduction</li> <li>● Absorption, distribution, metabolism, distribution and excretion in critical care</li> <li>● Plasma concentration, half life</li> <li>● Loading and maintenance dose</li> <li>● Therapeutic index and drug safety</li> <li>● Potency and efficacy</li> <li>● Principles of drug administration <ul style="list-style-type: none"> <li>○ The rights of drug administration</li> <li>○ Systems of measurement</li> <li>○ Enteral drug administration</li> <li>○ Topical drug administration</li> <li>○ Parenteral drug administration</li> </ul> </li> </ul>
III	5	<b>Pharmacology and Cardiovascular alterations</b> <ul style="list-style-type: none"> <li>● Vasoactive Medications</li> <li>● Vasodilator, Vasopressors,</li> </ul>

Unit	Hours	Content
		<ul style="list-style-type: none"> <li>• Inotropes</li> <li>• Cardiac glycosides - Digoxin</li> <li>• Sympathomimetics - Dopamine, dobutamine, epinephrine, isoproterenol, norepinephrine, phenylephrine</li> <li>• Phosphodiesterase inhibitors - amrinone, milrinone</li> <li>• Antiarrhythmic Medications</li> <li>• Cardiac conditions</li> <li>• Medications to improve cardiac contractility</li> <li>• Medications in the management of heart failure</li> <li>• Medications in the management of angina pectoris and myocardial infarction</li> <li>• Medications in the management of dysrhythmias, Heart block and conduction disturbances</li> <li>• Medications in the management of Pulmonary hypertension,</li> <li>• Medications in the management of Atherosclerotic disease of aorta and Peripheral artery disease</li> <li>• Medications in the management of Deep vein thrombosis</li> </ul>
IV	4	<p><b>Medications in management of infection</b>  <i>Indications, Mechanism of action, Dose, route, Administration guidelines, Adverse effects of drugs under:</i></p> <ul style="list-style-type: none"> <li>• Antibacterial drugs</li> <li>• Antibiotics against <ul style="list-style-type: none"> <li>○ Gram positive bacteria</li> <li>○ Gram negative bacteria</li> </ul> </li> <li>• First, Second, Third and Fourth generation antibiotics</li> <li>• Antibiotic resistance</li> <li>• Antifungal agents</li> <li>• Antiviral agents</li> <li>• Antiprotozoal drugs</li> </ul>
V	4	<p><b>Medications in Management of Hypertension</b></p> <ul style="list-style-type: none"> <li>• Diuretics</li> <li>• Calcium channel blockers</li> <li>• Beta adrenergic blockers</li> <li>• Alpha Adrenergic blockers</li> <li>• Angiotensin Converting Enzyme inhibitors</li> <li>• Angiotensin Receptor Blockers</li> </ul>
VI	5	<p><b>Medications in Management of Hyperglycemia (Glucose Lowering Agents)</b></p> <ul style="list-style-type: none"> <li>• Sulfonylureas (glipizide, glyburide, gliclazide, glimepiride)</li> <li>• Meglitinides (repaglinide and nateglinide)</li> <li>• Biguanides (metformin)</li> <li>• Thiazolidinediones (rosiglitazone, pioglitazone)</li> <li>• <math>\alpha</math>-Glucosidase inhibitors (acarbose, miglitol, voglibose)</li> <li>• DPP-4 inhibitors (Sitagliptin, Saxagliptin, Vildagliptin, Linagliptin, Alogliptin)</li> <li>• SGLT2 inhibitors (Dapagliflozin and Canagliflozin)</li> <li>• Cycloset (Bromocriptine)</li> </ul> <p><b>Insulin</b></p> <ul style="list-style-type: none"> <li>• Rapid-acting insulin</li> <li>• Short-acting insulin</li> <li>• Intermediate-acting insulin</li> <li>• Mixed insulin</li> <li>• Long-acting insulin</li> </ul>
VII	4	<p><b>Pharmacology and Pulmonary alterations</b></p> <ul style="list-style-type: none"> <li>• Medications used on patients on mechanical ventilation</li> <li>• Medications in the management of Pulmonary edema</li> <li>• Medications in the management of Pulmonary embolism</li> <li>• Medications in the management of Acute respiratory failure and acute respiratory distress syndrome</li> </ul>

Unit	Hours	Content
		<ul style="list-style-type: none"> <li>• Medications in the management of Chronic obstructive pulmonary disease</li> <li>• Medications in the management of Pneumonia</li> <li>• Medications in the management of Pleural effusion</li> </ul>
VIII	6	<p><b>Pharmacology in management of Pain and anxiety</b></p> <ul style="list-style-type: none"> <li>• Pain <ul style="list-style-type: none"> <li>○ NSAID</li> <li>○ Opioid analgesia</li> </ul> </li> <li>• Sedation <ul style="list-style-type: none"> <li>○ Gamma amino butyric acid stimulants</li> <li>○ Dexmedetomidine</li> <li>○ Analgosedation</li> </ul> </li> <li>• Delirium <ul style="list-style-type: none"> <li>○ Haloperidol</li> <li>○ Atypical anti-psychotics</li> </ul> </li> <li>• Medications used for local and general anesthesia <ul style="list-style-type: none"> <li>○ Local - Amides, esters, and miscellaneous agents</li> <li>○ General - Gases, Volatile liquids, IV anesthetics</li> <li>○ Non anesthetic drugs adjuncts to surgery</li> </ul> </li> <li>• Paralytic Medications <ul style="list-style-type: none"> <li>○ Non-depolarizing and depolarizing agents</li> <li>○ Anxiolytics</li> </ul> </li> <li>• Autonomic drugs <ul style="list-style-type: none"> <li>○ Adrenergic agents/Sympathomimetics</li> <li>○ Adrenergic blocking agents</li> <li>○ Cholinergic agents</li> <li>○ Anti -cholinergic agents</li> </ul> </li> <li>• Medications in the management of anxiety and insomnia <ul style="list-style-type: none"> <li>○ Antidepressants</li> <li>○ Benzodiazepines</li> <li>○ Barbiturates</li> </ul> </li> </ul>
IX	7	<p><b>Pharmacology and Nephrology alterations</b></p> <ul style="list-style-type: none"> <li>• Diuretics</li> <li>• Fluid replacement <ul style="list-style-type: none"> <li>○ Crystalloids</li> <li>○ Colloids</li> </ul> </li> <li>• Electrolytes <ul style="list-style-type: none"> <li>○ Sodium</li> <li>○ Potassium</li> <li>○ Calcium</li> <li>○ Magnesium</li> <li>○ Phosphorus</li> </ul> </li> <li>• Nephrology conditions <ul style="list-style-type: none"> <li>○ Medications in the management of Acute/Chronic Kidney Disease</li> <li>○ Medications in the management of Acute tubular necrosis</li> </ul> </li> <li>• Medications in the management of Bladder Outlet Obstructions <ul style="list-style-type: none"> <li>○ Medications in the management of Electrolyte imbalances</li> <li>○ Medications in the management of Acid base imbalances</li> <li>○ Medications used during dialysis</li> <li>○ Nephrotoxic drugs</li> </ul> </li> <li>• Standing orders for nephrology critical care emergencies</li> </ul>
X	4	<p><b>Pharmacology and Gastrointestinal alterations</b></p> <ul style="list-style-type: none"> <li>• Anti-ulcer drugs</li> <li>• Laxatives</li> <li>• Anti diarrheal</li> <li>• Anti emetics</li> <li>• Pancreatic enzymes</li> <li>• Nutritional supplements, Vitamins and minerals</li> </ul>

Unit	Hours	Content
XI	4	<b>Pharmacology and Hematology alterations in Nephrology</b> <ul style="list-style-type: none"> <li>• Anticoagulants</li> <li>• Antiplatelet drugs</li> <li>• Thrombolytics</li> <li>• Hemostatic/antifibrinolytics</li> <li>• Hematopoietic growth factors <ul style="list-style-type: none"> <li>○ Erythropoietin</li> <li>○ Colony stimulating factors</li> <li>○ Platelet enhancers</li> </ul> </li> <li>• Blood &amp; Blood Components</li> <li>• Vaccines</li> </ul>
XII	6	<b>Immunosuppressant Drugs in Nephrology</b> <ul style="list-style-type: none"> <li>• Induction agents <ul style="list-style-type: none"> <li>○ Polyclonal antibodies (ATG)</li> <li>○ Interleukin 2 receptor antagonists (Basiliximab)</li> </ul> </li> <li>• Maintenance Therapy <ul style="list-style-type: none"> <li>○ Calcineurin inhibitors (Cyclosporin, Tacrolimus)</li> <li>○ mTOR inhibitors (Sirolimus, Everolimus)</li> <li>○ Antiproliferative agents (Azathioprine, Mycophenolic acid)</li> <li>○ Corticosteroids (Prednisolone)</li> </ul> </li> <li>• Treatment for rejection <ul style="list-style-type: none"> <li>○ Corticosteroids, ATG, IVIG</li> </ul> </li> </ul>
<b>Total</b>	<b>54 hours</b>	

### Bibliography

- Hari Varun Kalluri, Karen L. Hardinger, Current State of Renal Transplant Immunosuppression: Present and Future, World J Transplant 2012 Aug (24), 2 (4): 51-68
- Eisen H.J. (2020) Pharmacology of Immunosuppression (1<sup>st</sup> ed.), Springer
- McKay G.A. & Walters M.R. (2021) Clinical Pharmacology and Therapeutics (10<sup>th</sup> ed.), Wiley-Blackwell
- Sheryl F. Vondracek & Isaac Teitebaum, Principles of Kidney Pharmacotherapy for the Nephrologist: Core Curriculum 2021, National Kidney Foundation, American Journal of Kidney Diseases, July 16 2021
- Wynne A.L., Woo T.M., Sheryl & Olyaei A.J. (2007) Pharmacotherapeutics for Nurse Practitioner Prescribers (2<sup>nd</sup> ed.), Philadelphia: Davis

### VI. Advanced Health/Physical Assessment

#### COMPETENCIES

1. Applies the physical assessment principles in developing appropriate system wise examination skills.
2. Uses advanced health assessment skills to differentiate between variations of normal and abnormal findings.
3. Orders screening and diagnostic tests based on the examination findings and institutional protocols.
4. Analyzes the physical examination findings and results of various investigations and works collaboratively with nephrologists for development of diagnoses.
5. Documents assessment, diagnosis, and management and monitors follow up care in partnership with health care team members, patients, and families.

**Hours of Instruction: Theory: 70 hours + Practical/Lab: 48 hours = 118 hours**

Unit	Hours	Content
I	4	<b>Introduction</b> <ul style="list-style-type: none"> <li>• Essentials of effective communication</li> <li>• Principles of professional communication</li> <li>• Components in history collection and physical assessment</li> </ul>
II	6	<b>Assessment of Cardiovascular system</b> <ul style="list-style-type: none"> <li>• Cardiac history</li> <li>• Physical examination</li> <li>• Cardiac laboratory studies - biochemical markers, hematological studies</li> <li>• Cardiac diagnostic studies - electrocardiogram, echocardiography, stress testing, radiological imaging, coronary angiogram</li> </ul>

<b>Unit</b>	<b>Hours</b>	<b>Content</b>
III	6	<b>Assessment of Respiratory system</b> <ul style="list-style-type: none"> <li>● History</li> <li>● Physical examination</li> <li>● Respiratory monitoring - arterial blood gases, pulse oximetry, end-tidal carbon dioxide monitoring</li> <li>● Respiratory Diagnostic tests - chest radiography, ventilation perfusion scanning, pulmonary angiography, bronchoscopy, thoracentesis, sputum culture, pulmonary function tests, ultrasound, lung biopsy</li> </ul>
IV	6	<b>Nervous system</b> <ul style="list-style-type: none"> <li>● Neurological history</li> <li>● General physical examination</li> <li>● Assessment of cognitive function</li> <li>● Assessment of cranial nerve function</li> <li>● GCS</li> <li>● Motor assessment - muscle strength, power, and reflexes</li> <li>● Sensory assessment - dermatome assessment</li> <li>● Neurodiagnostic studies - CT scan, MRI, PET</li> </ul>
V	6	<b>Renal system</b> <ul style="list-style-type: none"> <li>● History</li> <li>● Physical examination</li> <li>● Assessment of renal function - Lab studies, Diagnostic Tests <ul style="list-style-type: none"> <li>○ Urine Analysis</li> <li>○ Blood studies</li> <li>○ X-ray KUB</li> <li>○ Ultrasound Kidneys, Kidney Biopsy</li> <li>○ Renal Doppler</li> <li>○ Renal Angiogram</li> <li>○ Estimation of GFR</li> <li>○ Residual renal function</li> </ul> </li> <li>● Assessment of electrolytes and acid base balance</li> <li>● Assessment of fluid balance</li> </ul>
VI	5	<b>Gastrointestinal system</b> <ul style="list-style-type: none"> <li>● History</li> <li>● Physical examination</li> <li>● Nutritional assessment</li> <li>● Laboratory studies - liver function studies, blood parameters, stool test</li> <li>● Diagnostic studies - radiological and imaging studies, endoscopic studies</li> </ul>
VII	5	<b>Endocrine system</b> <ul style="list-style-type: none"> <li>● History, physical examination, laboratory studies, and diagnostic studies of <ul style="list-style-type: none"> <li>○ Hypothalamus and pituitary gland</li> <li>○ Thyroid gland</li> <li>○ Parathyroid gland</li> <li>○ Pancreas</li> <li>○ Adrenal gland</li> </ul> </li> </ul>
VIII	5	<b>Hematological system</b> <ul style="list-style-type: none"> <li>● History</li> <li>● Physical examination</li> <li>● Laboratory studies - blood parameters</li> <li>● Diagnostic studies</li> </ul>
IX	3	<b>Integumentary system</b> <ul style="list-style-type: none"> <li>● History</li> <li>● Physical examination</li> </ul>
X	6	<b>Musculoskeletal system</b> <ul style="list-style-type: none"> <li>● History</li> <li>● Physical examination - gait assessment, joint assessment,</li> <li>● Laboratory studies - blood parameters (inflammatory enzymes, uric acid)</li> </ul>

Unit	Hours	Content
		<ul style="list-style-type: none"> <li>Diagnostic studies - specific radiological and imaging studies, endoscopic studies related to renal disorders</li> </ul>
XI	5	<b>Reproductive system (Male &amp; Female) - Basic Assessment related to renal disorders</b> <ul style="list-style-type: none"> <li>History</li> <li>Physical examination</li> <li>Laboratory studies</li> <li>Diagnostic studies</li> </ul>
XII	4	<b>Assessment of Eye, Ear, Nose Throat</b> <ul style="list-style-type: none"> <li>Basic assessment of ENT</li> <li>Identify changes in the eye related to hypertension, diabetes and drug effects</li> </ul>
XIII	4	<b>Assessment of children</b> <ul style="list-style-type: none"> <li>Growth and development</li> <li>Nutritional assessment</li> <li>Specific system assessment</li> </ul>
XIV	5	<b>Assessment of older adults</b> <ul style="list-style-type: none"> <li>History</li> <li>Physical assessment considering age related changes</li> <li>Psychological assessment</li> <li>Specific system assessment</li> </ul>
<b>Total</b>	<b>70 hours</b>	

**List of skills to be practiced (48 hours include demonstration by the faculty and practice by the students)**

- Comprehensive history taking
- Focused history taking (system-wise)
- Comprehensive physical examination
- Focused physical examination (system-wise)
- Monitoring clinical parameters (system-wise)
  - Invasive BP monitoring, Multi-parameter Monitors, ECG, Peripheral vascular status, ABG, Pulse Oximeter, Intracranial Pressure (ICP), Glasgow Coma Scale (GCS), Cranial nerve assessment, Pain and Sedation score of critically ill, Motor assessment, Sensory assessment, Renal function tests, Fluid balance, acid base balance, electrolytes, Bowel sounds, Liver function tests, GRBS, Lab tests, Radiological and Imaging tests (system wise) Grading of edema
- Ordering and interpretation of screening and diagnostic tests (system-wise) (Enclosed **Appendix-3**)
- Estimation of GFR
- Assessment of AV Fistula
- Assessment of CVC
- Assessment of PD catheter site

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- Wilson S.F. & Giddens J.F. (2006) Health Assessment for Nursing Practice (4<sup>th</sup> ed.), St. Louis, Missouri: Saunders Elsevier

**NEPHROLOGY NURSING SPECIALTY COURSES**

**(Foundations of Nephrology Nursing Practice, Nephrology Nursing I and Nephrology Nursing II)**

**VII. Foundations of Nephrology Nursing Practice**

COMPETENCIES

- Applies advanced concepts of Nephrology nursing in assessment, diagnosis and management of Kidney disorders.
- Uses invasive and noninvasive technology and interventions to assess, monitor and promote physiologic stability.

3. Works in collaboration with other health care team members and prepares care/clinical pathways in assessment, diagnosis and management of patients with varied nephrology conditions.
4. Provides nursing care related to health protection, disease prevention, anticipatory guidance, counseling, management of kidney disorders, palliative care and end of life care.
5. Uses advanced skills in assessment, diagnosis and management of patients with common nephrology conditions.
6. Applies ethically sound solutions to issues related to individuals, populations and systems of care.
7. Practices principles of infection control relevant to nephrology settings.
8. Practices independently within the legal framework of the country towards the interest of patients, families and communities.
9. Develops practice that is based on scientific evidence.
10. Uses applicable communication, counseling, advocacy and interpersonal skills to initiate, develop and discontinue therapeutic relationships.
11. Creates and maintains a safe therapeutic environment using risk management strategies and quality improvement.
12. Adapts practice to the social, cultural and contextual milieu.

**Hours of Instruction: Theory: 96 hours + Practical/Skill Lab: 48 hours = 144 hours**

Unit	Hours	Content
I	10	<b>Introduction to Nephrology Nursing</b> <ul style="list-style-type: none"> <li>• Introduction to the course</li> <li>• History &amp; Scope of Nephrology nursing</li> <li>• Gross Anatomy, Embryology, Histology including Electron</li> <li>• Microscopy study of the Kidney</li> <li>• Renal circulation and Glomerular ultrafiltration.</li> <li>• Solute transport/Both Organic and inorganic.</li> <li>• Renal Acidification.</li> <li>• Urine Concentration &amp; Dilution.</li> <li>• Role of Kidney in Blood pressure regulation.</li> <li>• Endocrine and Autocrine functions of the kidney.</li> <li>• Setting up of Nephrology ward, Dialysis Unit and Transplant Unit, Nephrology ICU</li> </ul>
II	5	<b>Epidemiology of Kidney Disease</b> <ul style="list-style-type: none"> <li>• Epidemiology of Kidney Disease</li> <li>• Risk Factors and Kidney Disease</li> <li>• Nephron Endowment</li> <li>• Gender and Kidney Disease</li> <li>• Aging and Kidney Disease</li> </ul>
III	10	<b>Integrated control of body fluid volume and composition</b> <ul style="list-style-type: none"> <li>• Vasoactive peptides/Arachidonic Acid Metabolites.</li> <li>• Sodium - Water Balance.</li> <li>• Potassium Balance</li> <li>• Acid Base Balance</li> <li>• Calcium and Phosphorus Metabolism.</li> <li>• Magnesium metabolism.</li> <li>• Renal Handling of Uric acid</li> </ul>
IV	12	<b>Advanced Concepts and Principles in care of critically ill in Nephrology</b> <ul style="list-style-type: none"> <li>• Principles of cardio-pulmonary-brain resuscitation</li> <li>• Managing Emergencies: <ul style="list-style-type: none"> <li>• BLS</li> <li>• ACLS</li> <li>• Airway management</li> <li>• Oxygenation and oximetry, care of patient with oxygen delivery devices</li> <li>• Ventilation and ventilator support (including humidification and inhaled drug therapy), care of patient with invasive and non-invasive ventilation</li> </ul> </li> <li>• Circulation and perfusion (including hemodynamic evaluation and waveform graphics)</li> <li>• Evaluation of acid base status, fluid and electrolyte status</li> <li>• Thermoregulation, care of patient with hyper/hypothermia</li> </ul>

Unit	Hours	Content
		<ul style="list-style-type: none"> <li>• Liberation from life support (Weaning)</li> <li>• Glycemic control, care of patient with glycemic imbalances</li> <li>• Monitoring and improving kidney function in critically ill</li> <li>• Common drugs and drug delivery modes in management of critically ill patients</li> </ul>
V	8	<b>Approach to the patient with kidney disease</b> <ul style="list-style-type: none"> <li>• Laboratory Assessment of Kidney Disease including Biopsy</li> <li>• Interpretation of Electrolyte and Acid - Base Parameters in Blood and Urine</li> <li>• Adaptation to Nephron Loss</li> <li>• Renal and Systemic Manifestations of Glomerular Disease.</li> <li>• Diagnostic Kidney Imaging</li> </ul>
VI	6	<b>Psychosocial, Spiritual and Sleep alterations: Assessment and management</b> <ul style="list-style-type: none"> <li>• Stress and psychoneuroimmunology</li> <li>• Spiritual challenges</li> <li>• Coping with stress and illness</li> <li>• Counseling and communication</li> <li>• Grief Counseling</li> <li>• Assessing the Sleep Quality, Sleep hygiene</li> <li>• Anxiolytics, Sedatives and Relaxants</li> <li>• End of Life Care and After Life Services</li> </ul>
VII	6	<b>Patient and family education and counseling</b> <ul style="list-style-type: none"> <li>• Challenges of patient and family education</li> <li>• Process of adult learning</li> <li>• Assessing Health literacy</li> <li>• Factors affecting teaching learning process</li> <li>• Informational needs of patients and families</li> <li>• Counseling needs of patient and family</li> <li>• Counseling techniques</li> </ul>
VIII	6	<b>Nutrition Alterations and Management in Kidney Disorders</b> <ul style="list-style-type: none"> <li>• Nutrient metabolism and alterations</li> <li>• Assessing nutritional status</li> <li>• Nutritional Considerations in <ul style="list-style-type: none"> <li>○ Chronic Kidney Disease</li> <li>○ Hemodialysis, PD</li> <li>○ Nephrotic syndrome</li> <li>○ Hypertension</li> <li>○ Diabetes mellitus</li> </ul> </li> </ul>
IX	6	<b>Holistic Care for patients with Kidney Disorders</b> <ul style="list-style-type: none"> <li>• Integrative Care Model</li> <li>• Multidisciplinary care - Role of Dietician, Social worker, Occupational therapist, Physiotherapist, Counselor, Doctor, Nurse</li> <li>• Shared Decision-Making Model</li> <li>• Patient Rights, Responsibilities</li> <li>• Nursing Process application in care of patients with Kidney disorders</li> <li>• Government and private schemes available for treatment support of patients with kidney disorders</li> <li>• CKD Registry, care coordination between settings</li> <li>• National and International Organizations in Nephrology</li> </ul>
X	5	<b>Infection Control Practices in Nephrology setting</b> <ul style="list-style-type: none"> <li>• Breaking the Chain of Infection</li> <li>• Standard precautions</li> <li>• Use of PPE - Indications</li> <li>• Biohazard protocols</li> <li>• Disposal and segregation of Waste</li> <li>• Infection control practices in Dialysis Unit, Renal Transplant Unit</li> </ul>
XI	8	<b>Bioethics in Nephrology Nursing</b> <ul style="list-style-type: none"> <li>• Difference between morals and ethics</li> </ul>



Unit	Hours	Content
		<ul style="list-style-type: none"> <li>Ethical principles, ethical decision making in nephrology care, Strategies for promoting ethical decision making</li> <li>withholding and withdrawing treatment,</li> <li>Managing Scarce resource</li> <li>Brain death, Organ donation &amp; Counseling</li> <li>Renal Transplantation - related laws in India, State</li> <li>Do Not Resuscitate (DNR), Euthanasia, Living will</li> <li>Issues giving raise to civil litigation</li> <li>Medical futility</li> <li>Administrative law: Professional regulation</li> <li>Tort law: Negligence, professional malpractice, intentional torts, wrongful death, defamation, assault and battery</li> <li>Constitutional Law: Patient decision making</li> </ul>
XII	8	<b>Quality Assurance in Nephrology settings</b> <ul style="list-style-type: none"> <li>Continuous Quality Improvement</li> <li>Quality Accreditation bodies in India - Nephrology</li> <li>Ward, Dialysis Unit, Transplant Unit</li> <li>Standards, Protocols, Policies, Procedures</li> <li>Infection control policies and protocols</li> <li>Standard safety measures</li> <li>Nursing audits</li> <li>Microbiology Surveillance</li> <li>Monitoring of water Quality</li> <li>Performance Indicators in Nephrology and Measures</li> </ul>
	6	<b>Class tests</b>
<b>Total</b>	<b>96 hours</b>	

**List of skills to be practiced (48 hours include demonstration by the faculty and practice by the students)**

- Comprehensive Renal Assessment
- CPR (BLS and ACLS)
- Airway Management
  - Laryngeal mask airway
  - Cuff inflation and anchoring the tube
  - Care of ET tube
  - Tracheostomy care
  - Suctioning - open/closed
  - Chest physiotherapy
- Oxygenation and oximetry, care of patient with oxygen delivery devices
  - Devices to measure oxygen/oxygenation
  - Oximetry - Pulse oximetry
- Noninvasive ventilation
  - Low flow variable performance devices:* nasal catheters/cannulae/double nasal prongs, face mask, face mask with reservoir bags
  - High flow fixed performance devices:* Entrainment (Venturi) devices, NIV/CPAP/Anesthetic masks, T pieces, breathing circuits
  - Postural drainage
- Ventilation and ventilator support
  - Connecting to ventilator
  - Weaning from ventilator
  - Extubation
  - Humidifiers
  - Nebulizers - jet, ultrasonic
  - Inhalation therapy - metered dose inhalers (MDI), dry powder inhalers (DPI)
  - Circulation and perfusion (including hemodynamic evaluation and waveform graphics)
  - Invasive blood pressure monitoring
  - Non-invasive BP monitoring
  - Venous pressure (Peripheral, Central and Pulmonary artery occlusion pressure)

- Insertion and removal of arterial line
- Insertion and removal of central line
- Electrocardiography (ECG)
- Fluids and electrolytes
  - Fluid calculation and administration (crystalloids and colloids)
  - Administration of blood and blood products
  - Inotrope calculation, titration and administration
  - Cardiac glycosides - Digoxin
  - Sympathomimetics - Dopamine, dobutamine, epinephrine, isoproterenol, norepinephrine, phenylephrine
  - Electrolyte correction (Sodium, potassium, calcium, phosphorus, magnesium)
  - Use of fluid dispenser and infusion pumps
- Evaluation of acid base status
- Arterial blood gas (ABG)
- Glycemic control, care of patient with glycemic imbalances
  - Monitoring GRBS
  - Insulin therapy (sliding scale and infusion)
  - Management of hyperglycemia - IV fluids, insulin therapy, potassium supplementation
  - Management of hypoglycemia - Dextrose IV
- Counseling
- Family education
- Nutritional Assessment
- Therapeutic diet for kidney disorders
- Quality Improvement audit

### VIII. Nephrology Nursing I

**Hours of Instruction: Theory: 96 hours + Practical: 48 hours = 144 hours**

Unit	Hours	Content
I	10	<b>Acute Kidney Injury and Tubulointerstitial Diseases</b> <ul style="list-style-type: none"> <li>• Etiology, pathophysiology and classification of AKI</li> <li>• Etiology, Pathogenesis, Clinical manifestations, diagnosis and management of</li> <li>• Acute and Chronic Tubular Nephritis</li> <li>• Contrast nephropathy</li> <li>• Analgesic nephropathy</li> <li>• Heavy metal nephropathy</li> <li>• Myeloma related kidney disease</li> </ul>
II	15	<b>Glomerular Disease - Primary and Secondary</b> <ul style="list-style-type: none"> <li>• Classification of Glomerular diseases</li> <li>• Etiology, pathophysiology, clinical manifestation, Diagnosis and management of:               <ul style="list-style-type: none"> <li>○ Membranoproliferative glomerulonephritis (MPGN)</li> <li>○ Minimal Change Disease</li> <li>○ Focal Segmental Glomerulosclerosis (FSGS)</li> <li>○ Membranous nephropathy</li> <li>○ IgA Nephropathy</li> <li>○ Rapidly Progressive Glomerulonephritis (RPGN)</li> <li>○ Lupus Nephritis</li> <li>○ Diabetes Nephropathy</li> </ul> </li> <li>• Nephrotic syndrome</li> </ul>
II	4	<b>Micro and Macrovascular Diseases of Kidney</b> <ul style="list-style-type: none"> <li>• Renal Artery Stenosis</li> <li>• Renal Vein Thrombosis</li> <li>• Systemic Lupus Erythematosus</li> <li>• Poly arteritis Nodosa</li> </ul>
III	7	<b>Urinary tract obstruction and Obstructive Nephropathy</b> <ul style="list-style-type: none"> <li>• Renal Calculi</li> <li>• Benign Prostatic Hypertrophy</li> <li>• Bladder Outlet Obstruction</li> <li>• Bladder Tumor</li> </ul>

Unit	Hours	Content
IV	6	<b>Infections</b> <ul style="list-style-type: none"> <li>• Pyelonephritis - Acute, Chronic</li> <li>• TB Kidney</li> <li>• COVID and Kidneys</li> </ul>
V	10	<b>Chronic Kidney Disease</b> <ul style="list-style-type: none"> <li>• Etiology, Pathophysiology, clinical manifestation</li> <li>• Staging</li> <li>• Diagnosis</li> <li>• Management of CKD</li> </ul>
VI	8	<ul style="list-style-type: none"> <li>• Renal Neoplasia</li> <li>• Kidney disease in tropics</li> <li>• Pregnancy and Kidney diseases.</li> <li>• Systemic diseases that affect Kidneys</li> </ul>
VII	8	<b>Inherited Diseases of the Kidney</b> <ul style="list-style-type: none"> <li>• Inherited Disorders of Podocyte Function</li> <li>• Inherited Disorders of the Renal Tubule</li> <li>• Cystic Diseases of the Kidney</li> </ul>
VIII	6	<b>Hypertension and Kidney</b> <ul style="list-style-type: none"> <li>• Primary and Secondary Hypertension</li> <li>• Renovascular Hypertension and Ischemic Nephropathy</li> <li>• Hypertension and Kidney Disease in Pregnancy</li> </ul>
IX	6	<b>Diabetes and Kidney Disease</b> <ul style="list-style-type: none"> <li>• Nephropathy</li> <li>• Glycemic control, care of patient with glycemic imbalances</li> <li>• Diabetic Monitoring GRBS</li> <li>• Insulin therapy (sliding scale and infusion)</li> <li>• Management of Hyperglycemia - IV fluids, insulin therapy, potassium supplementation</li> <li>• Management of hypoglycemia</li> </ul>
IX	10	<b>Pediatric Nephrology</b> <ul style="list-style-type: none"> <li>• Developmental nephrology</li> <li>• Congenital diseases of the kidneys, ureters, urinary bladder and urethra.</li> <li>• Glomerular and tubular diseases</li> <li>• Systemic diseases affecting the kidney</li> <li>• Acute and Chronic Kidney Failure</li> <li>• Dialysis and Transplantation with respect to Pediatric Nephrology</li> </ul>
	6	<b>Class tests</b>
<b>Total</b>	<b>96 hours</b>	

*List of skills to be practiced (48 hours include demonstration by the faculty and practice by the students).*

- Estimation of GFR
- Staging of CKD
- Classification of AKI
- Interpretation of physical assessment and lab findings for clinical diagnosis
- History collection and physical assessment of patients with
  - AKI
  - CKD
  - Common glomerular disorders
  - Lupus nephritis
  - Tubulointerstitial disease
- Case study and presentation of common kidney disorders (4)
- Assist Renal biopsy (5)
- Perform Renal biopsy (10)
- Interpreting Renal Biopsy findings - LM, IF (10)
- Drug studies (8)

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## IX. Nephrology Nursing II

**Hours of Instruction: Theory: 96 hours + Practical: 48 hours = 144 hours**

Unit	Hours	Content
I	25	<p><b>Hemodialysis (HD)</b></p> <ul style="list-style-type: none"> <li>• History and Overview</li> <li>• Principles and Concepts</li> <li>• Procedure of hemodialysis</li> <li>• Initiating patients on HD: Guidelines</li> <li>• Dialysis machine - Parts, functioning</li> <li>• Dialysis efficiency</li> <li>• Dry weight assessment</li> <li>• Dialysis Adequacy</li> <li>• Assessment of patients before, during and after HD</li> <li>• Complications in HD: Prevention, Identification, Management</li> <li>• Dialysis Modalities including CRRT</li> <li>• CVC as Vascular access and Guidelines in CVC care</li> <li>• Arterio-Venous Fistula and AV graft as Vascular access and evidence based guidelines in management of AVF and AVG</li> <li>• Assessment of Vascular access</li> <li>• Vascular access related complications - Identification and management</li> <li>• UF and Sodium Profiling</li> <li>• Bicarbonate preparation</li> <li>• Disinfection protocols - Machine, RO tank, pipelines</li> <li>• Assurance of water quality (Purification process, Surveillance)</li> <li>• Nutritional considerations in HD</li> <li>• Comprehensive, holistic care of patients on HD</li> <li>• Insertion of CVC - temporary, permanent</li> <li>• Plasmapheresis</li> <li>• Infection Control Practices</li> <li>• Quality Assurance in HD</li> <li>• Recent trends and developments in HD</li> </ul>
II	20	<p><b>Peritoneal Dialysis (PD)</b></p> <ul style="list-style-type: none"> <li>• History and overview</li> <li>• Principles and Concepts in PD</li> <li>• Types of PD modalities including Automated PD</li> <li>• PD Exchange procedure</li> <li>• Selection of patients for PD based on assessment</li> <li>• PD prescription, PET, PD fluids</li> <li>• PD Adequacy</li> <li>• Infectious and non-infectious complications of PD: Identification and management</li> <li>• PD catheter insertion - percutaneous and Open</li> </ul>

Unit	Hours	Content
		<ul style="list-style-type: none"> <li>Care of patients before, during and following PD catheter insertion</li> <li>Identification and management of peritonitis</li> <li>Advantages and Disadvantages of PD</li> <li>Nutritional Considerations in PD</li> <li>Education and Counseling of patients and families</li> <li>Evidence based practices in PD</li> <li>Comprehensive and Holistic care of patients on PD and their families</li> <li>Recent trends in PD</li> </ul>
III	25	<b>Kidney Transplant</b> <ul style="list-style-type: none"> <li>History and Overview</li> <li>Surgical Procedure</li> <li>Types of Transplants</li> <li>Preparation of Donor and recipients for Transplant</li> <li>Transplant Immunology</li> <li>Early and late complications of Kidney Transplant - Identification and management</li> <li>Graft rejection: prevention, identification, management</li> <li>Drug assays, Immuno-suppressant therapy</li> <li>Care of patients following kidney transplant</li> <li>Fluid management protocol in RTU</li> <li>Infection Control practices in RTU</li> <li>Donor and recipient follow-up</li> <li>Standing orders in RTU</li> <li>Drug protocols</li> <li>Microbiology Surveillance, Quality Assurance in PD</li> <li>Recent trends and developments in kidney transplant therapy</li> <li><b>NOTTO</b></li> </ul>
IV	4	<b>Healthy Living Post-transplant</b> <ul style="list-style-type: none"> <li>Discharge Preparation of donor and recipient</li> <li>Rehabilitation &amp; follow up</li> <li>Healthy lifestyle including nutrition, rest, exercise</li> <li>Health risks and surveillance post-transplant</li> <li>Sexuality</li> <li>Safe living after transplantation</li> <li>QOL issues - post transplant</li> </ul>
V	4	<b>Psycho-social issues in Transplantation</b> <ul style="list-style-type: none"> <li>Psychological impact of transplant in donor and recipient</li> <li>Psycho social assessment of donor and recipient</li> <li>Prevention: Multidisciplinary care</li> <li>Role of nurse</li> <li>Role of support groups</li> </ul>
VI	4	<b>Transplant in Children</b> <ul style="list-style-type: none"> <li>Donor</li> <li>Receipt Clinical concerns following organ transplantation in children</li> </ul>
VII	4	<b>Education and Counselling:</b> <ul style="list-style-type: none"> <li>Right to the correct information</li> <li>Principles of Adult learning</li> <li>Effective communication skills</li> <li>Preparation of information sharing tools</li> <li>Shared Decision-making Process</li> <li>Education methods and strategies</li> </ul>
VIII	4	<b>Special Considerations</b> <ul style="list-style-type: none"> <li>HD in Acutely ill patients</li> <li>Acute PD</li> <li>PD in pregnancy</li> <li>Management of Anemia</li> </ul>

Unit	Hours	Content
		• Dialysis and Transplant in children and elderly
	6	Class tests
<b>Total</b>	<b>96 hours</b>	

*List of skills to be practiced (48 hours include demonstration by the faculty and practice by the students).*

#### **Hemodialysis**

- Pre, Intra, Post dialysis assessment
- Assessment of Vascular Access - CVC, AVF, AVG
- CVC site care
- Dry Weight assessment - Clinical and bio-impedance method
- UF calculation, programming machine, Staring HD
- Closing HD
- Bicarb preparation
- Heparin preparation
- Drug reciliation
- Estimating URR, Kt/V, Assess dialysis adequacy
- Prescribe routine investigations and follow up results
- HD prescription
- Prescription of common drugs based on lab reports: Erythropoietin, Phosphorous binders, Calcium and Vitamin D supplements, Antihypertensives, OGLA
- Insulin Dose adjustment
- Perform varied Dialysis modalities - SCUF, Isolated UF, SLED, CRRT
- Perform Plasmapheresis
- Calculate plasma volume for removal
- Insertion of CVC into femoral and jugular vein
- Urine culture-SPC
- CVC removal
- Blood culture
- Ascitic tap

#### **Peritoneal Dialysis**

- Assess and Select patients for PD
- Perform PET, Determine PD prescription
- Perform PD exchanges
- Collect PD Fluid for culture
- Identify and manage Exit site infection, Tunnel infection and peritonitis
- Administer intraperitoneal antibiotics
- Alter PD prescription based on clinical assessment and PET
- Assess Dialysis adequacy including Kt/V
- Identify and manage noninfectious complications of PD

**The skills listed under the Specialty courses such as Foundations of Nephrology Nursing Practice, Nephrology Nursing I and Nephrology Nursing II are taught by the faculty in skill lab. The students after practicing them in the lab, will continue to practice in the respective clinical areas. The log book specifies all the requirements to be completed and the list of skills that are to be signed by the preceptor once the students develop proficiency in doing the skills independently.**

#### **Bibliography**

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- Joyce M. Black (2009) Medical-Surgical Nursing: Clinical Management for Positive Outcomes (8<sup>th</sup> ed.), USA: W.B. Saunders Company
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**Appendix-1**  
**EQUIPMENT LIST FOR A NEPHROLOGY UNIT (20 beds)**

1. Adjustable electronic cot with mattress - 20
2. IV stand - 10
3. Bed side locker - 20
4. Over bed trolley - 10
5. Dressing trolley (small) - 5
6. Dressing trolley (medium) - 2
7. Syringe pump - 4
8. Infusion pump - 5
9. Monitors - 5
10. Transport monitor/pulse oximeter - 5
11. ECG machine - 1
12. Ultrasound machine - 1
13. CART trolley - 1
14. Defibrillator - 1
15. Alpha mattress with motor - 3
16. Transfer trolley - 4
17. OR trolley - 2
18. Safe slider - 2
19. Computer - 2
20. Printer - 1
21. Bain circuit - 12
22. Oxygen flow meter - 20
23. Suction port with jar - 20
24. Air flow meter/pulmoaid - 5
25. Refrigerator - 2 (1 - feeds, 1 - drugs, 1)
26. Metal foot step/foot stool - 5
27. Ambulation chair - 5
28. UPS - 1
29. Flat trolley - 1
30. Labelling machine - 1
31. Glucometer - 2
32. Ambu bag with different sizes - 2 sets

**Hemodialysis Unit (10 beds) - some of the listed requirement may vary based on the number of dialysis shifts**

1. Dialysis machines -10
2. Bicarbonate preparation tank - 1
3. Water treatment plant with RO, Endotoxin filter - 1
4. Dialysis pipelines that are compatible to chemical/heat disinfection
5. Dialyzers and tubings
6. Infusion pump - 1
7. Syringe pump - 1
8. Patient monitors - 5
9. CART trolley - 1
10. Defibrillator - 1
11. Vacuum and oxygen lines for all the beds
12. Oxygen flow meters - 10
13. Ventilator - 1
14. Cannulation sets - 20
15. CVC sets - 20
16. Machine reprocessing unit (if dialyzers are reused)
17. Computers - 2
18. Printer - 1
19. Small dressing trolleys - 10
20. Large dressing trolley - 1
21. Over bed tables - 10
22. Cots/Dialysis chairs - 10
23. Minor OR with OR table, Lights - 1 (for procedures as CVC and PD catheter insertions)
24. Electronic platform weighing scale - 1
25. Electronic BP monitor - 1
26. Pulse oximeter - 2

27. Glucometer - 2
28. Wheel chairs - 5
29. Stretcher - 2
30. Storage racks
31. Filing cabinets
32. Refrigerators - 2

#### **Renal Transplant Unit - 5 beds**

1. Infusion pumps - 4
2. Syringe pump - 2
3. Patient Monitors - 5
4. CART trolley - 1
5. Defibrillator - 1
6. vacuum and oxygen lines for all the beds
7. Oxygen flow meters - 5
8. Ventilator - 1
9. Freezer - 1
10. Refrigerator - 2
11. Microwave oven - 1
12. Computers - 2
13. Printer - 1
14. Small dressing trolleys - 5
15. Large dressing trolley - 1
16. Over bed tables - 5
17. Adjustable cots - 5
18. AC with hepafilter - 1
19. Electronic weighing scale - 1
20. Electronic BP monitor - 1
21. Pulse oximeter - 2
22. Glucometer - 2
23. Wheel chairs - 3
24. Stretcher - 2
25. Ambulation chairs - 5

### **Appendix-2**

#### **ASSESSMENT GUIDELINES (including OSCE guidelines)**

#### **INTERNAL ASSESSMENT (Theory and Practical)**

##### **1<sup>st</sup> year**

#### **1. Theoretical Basis for Advanced Practice Nursing**

**College examination of theory only: 50 marks**

##### **Internal assessment:**

Test paper/Quiz: 10 marks

Written assignment/term paper: 10 marks (Global and national health care trends & policies)

Clinical seminar (Clinical/Care pathway in specific clinical condition/Application of specific nursing theory): 5 marks

**Final theory college exam: 25 marks**

**Total marks: 50 marks**

#### **2. Research Application and Evidence Based Practice in Nephrology Nursing Practice**

##### **Theory:**

Test papers: 20 marks

Written assignment: 5 marks (Literature review/Preparation of research instrument)

Journal club : 5 marks (Analysis of research evidence for competencies in Nephrology)

**Total : 30 marks**

#### **3. Advanced Skills in Leadership, Management and Teaching Skills**

##### **Theory:**

Test papers : 15 marks

Journal club (Trends in Leadership/management/Teaching): 5 marks

Written assignment: 5 marks - Designing an ideal Dialysis Unit and Renal Transplant Unit

Microteaching: 5 marks



**Total : 30 marks**

**4. Advanced Pathophysiology & Advanced Pharmacology applied to Nephrology Nursing**

**Theory:**

Test papers and Quiz: 20 marks (Pathophysiology - 10, Pharmacology - 10)

Drug studies-5 marks (Drug study and presentation)

Case presentation and case study report (Pathophysiology): 5 marks

**Total : 30 Marks**

**5. Advanced Health/Physical Assessment**

**Theory:**

Test papers: 20 marks

Written assignment: 10 marks (Diagnostic/investigatory reports-interpretation and analysis of findings)

**Total: 30 marks**

**Practicum:**

Clinical performance evaluation: 10 marks

End of posting exam (OSCE)-10 marks

Case presentation and case study report -5 marks

Internal OSCE: 25 marks

**Total Internal practical: 50 marks**

End of posting exam may be conducted in nephrology ward, Hemodialysis unit, Peritoneal dialysis unit or transplant unit

**II<sup>nd</sup> year**

**1. Foundations of Nephrology Nursing Practice**

**Theory:**

Test papers and Quiz: 20

Written assignment: 10 marks

**Total: 30 marks**

**Practicum:**

Clinical Performance evaluation: 20 marks

End of posting exam (OSCE): 10 marks

Drug studies (Drug study and presentation): 10 marks

Case presentation and case study report (Family education/counseling): 5 marks

Case presentation (Application of Clinical/Care Pathway): 5 marks

Internal OSCE: 50 marks

**Total Internal practical: 100 marks**

**2. Nephrology Nursing I**

**Theory:**

Test papers and Quiz: 20 marks

Clinical seminar and Journal club: 10 marks

**Total: 30 marks**

**Practicum:**

Clinical performance evaluation: 20 marks

End of posting exam (OSCE)-10 marks

Clinical presentation: 10 marks

Case study report: 10 marks

Internal OSCE: 50 marks

**Total Internal practical: 100 marks**

**3. Nephrology Nursing II**

**Theory:**

Test papers: 20 marks

Clinical Seminar: 10 marks

**Total: 30 marks**

**Practicum:**

Clinical performance evaluation: 20 marks

End of posting exam (OSCE): 10 marks

Clinical presentation: 10 marks

Case study report (developed clinical/care pathway): 10 marks

Internal OSCE:50 marks

**Total Internal practical: 100 marks**

(End of posting exam may be conducted in nephrology ward, dialysis unit or transplant unit)

**4. Dissertation/EBP Project**

Practicum: 50 marks

**EXTERNAL (FINAL) EXAMINATION (As per schedule in syllabus)**

Theory: Short answer and essay type questions (Weightage can be decided by the University) {Essay 2×15 marks = 30, Short answers 5×6 marks = 30, Very short 5×2 marks = 10}

**OSCE GUIDELINES FOR INTERNAL AND EXTERNAL PRACTICAL EXAMINATION**

**I<sup>st</sup> year**

**1. HEALTH ASSESSMENT**

**INTERNAL**

**OSCE: 25 marks**

**CORE COMPETENCY DOMAINS TO BE EXAMINED**

1. Focused history taking and physical examination of adult patient
2. Focused history taking and physical examination of pediatric patient
3. Interpretation of findings and results
4. Monitoring of clinical parameters

**Number of stations: 5 (4+1 Rest station)**

**Time for each station: 10 minutes**

**Marks for each station: 5 marks (As per competency Check list and allotted marks)**

**Total: 4×5 = 20 marks**

**Oral exam = 5 marks**

**Total = 25 marks**

**EXTERNAL**

**OSCE:50 marks**

**CORE COMPETENCY DOMAINS**

1. Focused history taking of adult patient
2. Focused physical examination of adult patient
3. Focused history taking of pediatric patient
4. Focused physical examination of pediatric patient
5. Interpretation of history and physical exam findings
6. Interpretation of results of lab and diagnostic tests
7. Monitoring clinical parameters

**Number of stations: 10 (8+2 Rest stations)**

**Time for each station: 10 minutes**

**Marks for each station: 5 marks (As per competency**

**Check list and allotted marks)**

**Total: 8×5 = 40 marks**

**Oral exam = 10 marks**

**Total = 50 marks**

**On completion of procedural competencies in log book and clinical requirements, the NP student is qualified to appear for final practical examination**

**II<sup>nd</sup> year**

**1. FOUNDATIONS OF NEPHROLOGY NURSING PRACTICE**

**INTERNAL**

**OSCE: 50 Marks**

**CORE COMPETENCY DOMAINS TO BE EXAMINED**

1. Focused history and physical examination and interpretation of findings and results

2. Monitoring competencies (invasive and noninvasive)
3. Therapeutic interventions - (emergency procedural competencies) including drug administration
4. Family education and counseling

**Number of stations: 5 (4+1 Rest station)**

**Time for each station: 10 minutes**

**Marks for each station: 10 marks (As per competency check list and allotted marks)**

**Total: 10×4 = 40 marks**

**Oral exam = 10 marks**

**Total = 50 marks**

**EXTERNAL**

**OSCE:100 marks**

**CORE COMPETENCY DOMAINS**

1. Focused history taking, physical examination and interpretation of results of adult patient
2. Focused history taking, physical examination and interpretation of results of pediatric patient
3. Monitoring competencies (invasive and noninvasive)
4. Monitoring competencies (invasive and noninvasive)
5. Development of care plan
6. Family education and counseling
7. Therapeutic interventions (emergency procedures) including drug administration

**Number of stations: 10 (8+2 Rest stations)**

**Time for each station: 10 minutes**

**Marks for each station: 10 marks (As per competency check list and allotted marks)**

**Total: 8×10 = 80 marks**

**Oral exam = 20 marks**

**Total = 100 marks**

## 2. NEPHROLOGY NURSING I & II

**INTERNAL**

**OSCE-50 marks**

**CORE COMPETENCY DOMAINS**

1. Focused history and physical examination and interpretation of findings and results
2. Monitoring competencies (Invasive and noninvasive)
3. Therapeutic procedures (CVC insertion, PD catheter insertion, Hemodialysis, Peritoneal Dialysis, Plasmapheresis, CRRT, SLED)
4. Development of plan of care/care pathway
5. Diagnostic interventions (Renal biopsy, Ascitic tap, Blood culture, CVC and PD catheter site culture, PD Fluid culture, PET Test, Suprapubic urine aspirate for culture, Ultrasound kidneys, Ultrasonography - AV access flow)
6. Drug prescription and administration
7. Hemodialysis
8. Peritoneal Dialysis
9. Kidney Transplantation – pre- and post-transplant care

**Number of stations: 5 (4+1 Rest station)**

**Time for each station: 10 minutes**

**Marks for each station: 10 marks (As per competency check list and allotted marks)**

**Total: 10×4 = 40 marks**

**Oral exam = 10 marks**

**Total = 50 marks**

**EXTERNAL**

**OSCE:100 marks**

**CORE COMPETENCY DOMAINS**

1. Focused history taking, physical examination and interpretation of results of adult patient
2. Focused history taking, physical examination and interpretation of results of pediatric patient
3. Monitoring competencies (Invasive and noninvasive)

4. Family education and counseling
5. Development of plan of care/care pathway
6. Family education and counseling
7. Drug administration
8. Diagnostic interventions (Renal biopsy, Ascitic tap, Blood culture, CVC and PD catheter site culture, PD Fluid culture, PET Test, Suprapubic urine aspirate for culture, Ultrasound kidneys, Ultrasonography - AV access flow))
9. Therapeutic interventions (Hemodialysis, Peritoneal dialysis, CVC insertion, PD catheter insertions, Plasmapheresis, CRRT, SLED)

**Number of stations: 10 (8+2 Rest stations)**

**Time for each station: 10 minutes**

**Marks for each station: 10 marks (As per competency check list and allotted marks)**

**Total: 8×10 = 80 marks**

**Oral exam = 20 marks**

**Total = 100 marks**

**On completion of procedural competencies in log book and clinical requirements, the NP student is qualified to appear for final practical examination.**

### Appendix-3

#### CLINICAL LOG BOOK FOR NURSE PRACTITIONER IN NEPHROLOGY NURSING (NPNepN) (Specific Procedural Competencies/Clinical Skills)

I<sup>st</sup> year

S.No.	Specific Competencies/Skills	No. performed	Date	Signature of the Preceptor*/Faculty
<b>I</b>	<b>RESEARCH APPLICATION AND EVIDENCE BASED PRACTICE</b>			
1	Preparation of research instrument			
2	Writing systematic review/literature review			
3	Preparation of a manuscript for publication (I <sup>st</sup> or II <sup>nd</sup> year)			
4	Research Project/EBP Project Topic:			
<b>II</b>	<b>LEADERSHIP, MANAGEMENT, AND TEACHING</b>			
1	Preparation of staff patient assignment			
2	Performance indicators and measures			
3	Develop patient education aids			
4	Patient care audit in the unit			
5	Develop technology assisted education aid for nurses			
6	Quality improvement audit			
7	Microteaching - Staff nurses			
8	Patient education and counseling			
9	Planning and conducting OSCE/OSPE			
10	Construction of tests			
<b>III</b>	<b>HEALTH ASSESSMENT</b>			
<i>1</i>	<i>Comprehensive history taking and clinical assessment</i>			
1.1	Acute Kidney Injury			
1.2	Tubulointerstitial disease			
1.3	Chronic Kidney Disease			
1.4	Glomerular disease			
1.5	Nephrotic syndrome			
1.6	Fluid volume status			
1.7	Comprehensive system wise physical assessment			

S.No.	Specific Competencies/Skills	No. performed	Date	Signature of the Preceptor*/Faculty
<b>2</b>	<b><i>Age specific history &amp; physical examination (Nephrology)</i></b>			
2.1	Neonate			
2.2	Child			
2.3	Adult			
2.4	Geriatric			
2.5	Pregnant			
<b>IV</b>	<b>DIAGNOSTIC PROCEDURES</b>			
<b>1</b>	<b><i>Collecting blood sample for laboratory tests</i></b>			
1.1	Biochemistry			
1.2	Clinical pathology			
1.3	Microbiology			
1.4	ABG			
<b>2</b>	<b><i>Assist/Perform</i></b>			
2.1	Paracentesis			
2.2	Thoracentesis			
2.3	Lumbar puncture			
2.5	Renal biopsy			
2.6	Bone marrow aspiration			
2.7	Ultrasound kidneys			
2.8	Ultrasonographic assessment of access flow			
2.9	ECG and interpretation			
2.10	ABG analysis and interpretation			
<b>3</b>	<b><i>Observe procedures</i></b>			
3.1	Renal Doppler			
3.2	Fistulogram			
3.3	Drug assay			
3.4	MRI/CT			
3.5	Renal angiogram			
3.6	Pathological examination of kidney tissue (LM, IF, EM)			
3.7	Echocardiogram			
<b>V.</b>	<b>COMPETENCIES IN NEPHROLOGY</b>			
<b>1</b>	<b><i>Drug administration and prescription in kidney disorders</i></b>			
1.1	Antihypertensives			
1.2	Oral glucose lowering agents			
1.3	Sodium correction			
1.4	Potassium correction			
1.5	Inotropes			
1.6	Vitamin and mineral supplements			
1.7	Intravenous fluid administration			
1.8	Insulin dose adjustment			
<b>2</b>	<b><i>Nutritional Assessment &amp; Management</i></b>			
2.1	Perform nutritional assessment			
2.2	Plan therapeutic diet for patient with CKD			
2.3	Plan therapeutic diet for patient with diabetes			

S.No.	Specific Competencies/Skills	No. performed	Date	Signature of the Preceptor*/Faculty
2.4	Nasogastric tube insertion			
2.5	NG Feeding			
2.6	Total Parenteral Nutrition			
<b>3</b>	<b><i>Airway Management</i></b>			
	<i>Non-invasive ventilation</i>			
3.1	Low flow variable performance devices: nasal catheters/cannulae/double nasal prongs, face mask, face mask with reservoir bags			
3.2	High flow fixed performance devices: Entrainment (Venturi) devices, CPAP, BiPAP			
	<i>Invasive ventilation</i>			
3.3	Setting of mechanical ventilator			
3.4	Care of patient on mechanical ventilator			
3.5	Insertion of endotracheal tube			
3.6	Removal of endotracheal tube			
3.7	Endotracheal suctioning			
3.8	Tracheostomy care			
3.9	Confirm the position of ET tube			
3.10	Chest physiotherapy			
3.11	Postural drainage			
<b>4</b>	<b><i>Use of equipment</i></b>			
4.1	Infusion pumps			
4.2	Syringe pumps			
4.3	Defibrillator			
<b>5</b>	<b><i>Life support and end of life care</i></b>			
5.1	BLS			
5.2	ACLS			
5.3	Grief counseling			
5.4	Breaking bad news			
<b>6</b>	<b><i>Patient Education and Counseling</i></b>			
6.1	Slowing down the progress of CKD			
6.2	Therapeutic diet in CKD			
6.3	Diabetes management			
<b>7</b>	<b><i>Communication, Problem solving and Critical Thinking</i></b>			
7.1	Clinical Scenarios simulations			
7.2				
<b>8</b>	<b><i>Monitoring and interpretation of critical parameters</i></b>			
8.1	Arterial Blood Gas (ABG)			
8.2	Hemodynamics			
8.3	Electrocardiogram (ECG)			
8.4	Invasive BP monitoring			
8.5	Noninvasive BP monitoring			
8.6	Glasgow Coma Score			
8.7	Sedation Score			
8.8	Pain Score			
8.9	Braden Score			
8.10	Bowel sounds			

S.No.	Specific Competencies/Skills	No. performed	Date	Signature of the Preceptor*/Faculty
8.11	GRBS			
8.12	GFR Estimation and CKD staging			
8.13	Chest X-ray			

\*When the student is found competent to perform the skill, it will be signed by the preceptor.

**Students:** Students are expected to perform the listed skills/competencies many times until they reach level 3 competency, after which the preceptor signs against each competency.

**Preceptors/Faculty:** Must ensure that the signature is given for each competency only after they reach level 3.

- Level 3 Competency denotes that the NPNepN student is able to perform that competency without supervision.
- Level 2 Competency denotes that the student is able to perform each competency with supervision.
- Level 1 Competency denotes that the student is not able to perform that competency/skill even with supervision.

Signature of the Program Coordinator/Faculty

Signature of the HOD/Principal

### CLINICAL LOG BOOK FOR NURSE PRACTITIONER IN NEPHROLOGY NURSING (NPNepN)

II<sup>nd</sup> year

S.No.	Specific Competencies/Skills	No. performed	Date	Signature of the Preceptor*/Faculty
	<b>ADVANCED COMPETENCIES</b>			
<i>1</i>	<i>Hemodialysis</i>			
1.1	Pre, Intra, Post dialysis assessment			
1.2	Assessment of CVC			
1.3	Assessment of AV Fistula			
1.4	CVC site care			
1.5	Dry Weight assessment - Clinical and bio-impedance method			
1.6	UF calculation			
1.7	Programming machine and starting HD			
1.8	Closing HD			
1.9	Bicarb preparation			
1.10	Estimating URR, Kt/V, Assess dialysis adequacy			
1.11	Prescribe routine investigations and follow up results			
1.12	HD prescription			
1.13	Heparin preparation			
1.14	Drug reconciliation			
1.15	Prescription of common drugs based on lab reports: Erythropoietin, Phosphorous binders, Calcium and Vitamin D supplements, Antihypertensives, OGLA			
1.16	Perform varied Dialysis modalities a. SCUF b. Isolated UF c. SLED d. CRRT			
1.17	Perform Plasmapheresis			
1.18	Calculate plasma volume for removal			
1.19	Insertion of CVC into femoral and jugular vein			
1.20	Identify and manage complications in HD a. Intradialytic hypotension b. Hemolysis c. Muscle cramps d. Air embolism			

S.No.	Specific Competencies/Skills	No. performed	Date	Signature of the Preceptor*/Faculty
1.21	Identify and manage CVC related complications			
1.22	Identify and manage AVF related complications			
<b>2</b>	<b><i>Peritoneal Dialysis</i></b>			
2.1	Assess and select patients for PD			
2.2	Perform PET, Determine PD prescription			
2.3	Perform PD exchanges			
2.4	Collect PD Fluid for culture			
2.5	Identify and manage Exit site infection, Tunnel infection and peritonitis			
2.6	Administer intraperitoneal antibiotics			
2.7	Alter PD prescription based on clinical assessment and PET			
2.8	Assess Dialysis adequacy including Kt/V			
2.9	Identify and manage noninfectious complications of PD			
<b>3</b>	<b><i>Kidney Transplantation</i></b>			
3.1	Pretransplant work up and evaluation of donor and recipient			
3.2	Counseling and selection of patients for transplant			
3.3	Legal formalities and Documentation			
3.4	Assist for donor nephrectomy			
3.5	Assist in Kidney Transplantation			
3.6	Preoperative care - Donor, Recipient			
3.7	Post operative care - Donor & Recipient			
3.8	Deceased Donor registry			
3.9	Assessment of brain death			
3.10	Perfusion of renal blood vessels before transplantation			
3.11	Fluid Management following Kidney Transplant			
3.12	Identify and manage graft rejection			
3.13	Identify and manage transplant related infections			
3.14	Wound and drain care			
3.15	Assess and evaluate the graft function following transplant			
<b>4</b>	<b><i>Patient Education and Counseling</i></b>			
4.1	Management of vascular access			
4.2	Kidney Replacement Therapy options			
4.3	Prevention and Management of complications in PD			
4.4	Post Kidney transplantation care			
<b>5</b>	<b><i>Drug Administration and Prescription</i></b>			
5.1	<b>Catecholamines</b> (calculation, titration & administration) a. Adrenaline b. Noradrenaline c. Dopamine d. Dobutamine			
5.2	<b>Immunosuppressant Drugs in Nephrology</b>			
a	<i>Induction agents</i> Polyclonal antibodies (ATG)			



S.No.	Specific Competencies/Skills	No. performed	Date	Signature of the Preceptor*/Faculty
	Interleukin 2 receptor antagonists (Basiliximab)			
b	<i>Maintenance Therapy</i> Calcineurin inhibitors (Cyclosporin, Tacrolimus) mTOR inhibitors (Sirolimus, Everolimus)			
c	<i>Antiproliferative agents</i> (Azathioprine, Mycophenolic acid)			
d	<i>Corticosteroids</i> (Prednisolone)			
e	<i>Treatment for rejection</i> Corticosteroids, ATG, IVIG			
5.3	<i>Erythropoietin injection and dose adjustment</i>			
<b>6</b>	<b><i>Infection Control Practices</i></b>			
6.1	Standard Precautions			
6.2	Infection control protocols in HD unit			
6.3	Infection control protocols in PD unit			
6.4	Infection control practices in Renal Transplant Unit			
<b>7</b>	<b><i>Quality Assurance/Improvement</i></b>			
7.1	Capture and present performance indicators measures in Dialysis unit			
7.2	Microbiology surveillance in HD unit, RTU			
7.3	Water quality management			
7.4	Quality improvement Audit			
<b>8</b>	<b><i>Management of Cardiovascular Alterations</i></b>			
8.1	Intravenous fluid administration (Colloid/Crystalloid)			
8.2	Blood and blood product administration			
8.3	Application of TED stocking			
8.6	Blood collection from arterial line			
<b>9</b>	<b><i>Management of Neurological Alterations</i></b>			
9.1	Sensory stimulation			
9.2	Consciousness/Coma status monitoring			
9.3	Brain death evaluation			
<b>10</b>	<b><i>Ordering Investigations</i></b>			
10.1	ECG			
10.2	ABG			
10.3	Chest X ray			
10.4	Ultrasound			
10.5	Basic biochemistry investigations			
10.6	Basic microbiology investigations			
<b>11</b>	<b><i>Ordering Procedures/Treatment</i></b>			
11.1	Nebulization			
11.2	Chest physiotherapy			
11.3	Hemodialysis			
11.4	Insertion and removal of urinary catheter			
11.5	SCUF			
11.6	TEDS			
11.7	Isolated UF			
11.8	SLED			
11.9	First HD protocol			

S.No.	Specific Competencies/Skills	No. performed	Date	Signature of the Preceptor*/Faculty
11.10	Therapeutic diet			

\*When the student is found competent to perform the skill, it will be signed by the preceptor.

**Students:** Students are expected to perform the listed skills/competencies many times until they reach level 3 competency, after which the preceptor signs against each competency.

**Preceptors/Faculty:** Must ensure that the signature is given for each competency only after they reach level 3.

- Level 3 Competency denotes that the NPNepN student is able to perform that competency without supervision.
- Level 2 Competency denotes that the student is able to perform each competency with supervision.
- Level 1 Competency denotes that the student is not able to perform that competency/skill even with supervision.

**Note:** 5-10% of procedures that are rare should be practiced in skill lab and attained level 3 competency.

Signature of the Program Coordinator/Faculty

Signature of the HOD/Principal

#### Appendix-4

### CLINICAL REQUIREMENTS FOR NURSE PRACTITIONER IN NEPHROLOGY NURSING (NPNepN)

#### 1<sup>st</sup> year

S.No.	Clinical Requirement	Date	Signature of the Preceptor/Faculty
<b>1</b>	<b><i>Clinical Seminar/Journal Club/Clinical Conference</i></b>		
1.1	* <b>APN</b> - Clinical pathway in specific clinical condition/ Application of specific nursing theory (Clinical Seminar) <i>Title of the topic:</i>		
1.2	* <b>RA</b> - Evidence search for nephrology nursing competencies (Clinical Conference/Journal Club) <i>Title of the topic:</i>		
1.3	* <b>L,M&amp;T</b> - Trends in Leadership/Management/Teaching (Journal Club) <i>Title of the topic:</i>		
<b>2</b>	<b><i>Clinical Rounds (with Nursing Staff, Faculty, Students) - Case/Clinical Presentation</i></b>		
2.1	<b>Pathophysiology</b> (Clinical Presentation) <i>Name of clinical condition:</i>		
2.2	<b>Pathophysiology</b> (Clinical Presentation) Case Study (Written Report) <i>Name of clinical condition:</i>		
2.3	<b>Pharmacology</b> - Drug Studies (Drugs listed under Standing Orders) - Written report of 5 presentations (Bedside Presentations) <i>Drug name:</i>		
2.3.1			
2.3.2			
2.5			
2.6			
2.7			
2.8			
2.9			
2.10			
2.11			
2.12			
<b>3</b>	<b><i>Interdisciplinary Clinical Rounds (with Doctors) - Case/Clinical Presentation (Written reports are for submission)</i></b>		

S.No.	Clinical Requirement	Date	Signature of the Preceptor/Faculty
3.1	<b>Health Assessment (Adult)</b> - History & Physical Examination (Two written reports) 3.1.1. 3.1.2. 3.1.3. 3.1.4. 3.1.5.		
3.2	<b>Health Assessment (Pediatric)</b> - History & Physical Examination (One written report) 3.2.1. 3.2.2. 3.2.3.		
3.3	<b>Health Assessment (Pregnant Woman)</b> (One written report) 3.3.1. 3.3.2.		

\*Advanced Practice Nursing - APN; Research Application - RA, Leadership, Management and Teaching - L,M&T

Signature of the Program Coordinator/Faculty

Signature of the HOD/Principal

**CLINICAL EXPERIENCE DETAILS**

Name of Clinical Area	Clinical Condition	No. of days care given	Signature of Faculty/Preceptor

Signature of the Program Coordinator/Faculty

Signature of the HOD/Principal

**CLINICAL REQUIREMENTS FOR NURSE PRACTITIONER IN NEPHROLOGY NURSING (NPNepN)  
II<sup>nd</sup> year**

S.No.	Clinical Requirement	Date	Signature of the Preceptor/Faculty
1 1.1	<i>Clinical Seminar/Journal Club/Clinical Conference</i>		
	<b>Foundations of Nephrology Nursing Practice (Clinical Conference)</b>		

S.No.	Clinical Requirement	Date	Signature of the Preceptor/Faculty
	<i>Title of the topic:</i>		
1.2	<b>Nephrology Nursing I</b> (Clinical Seminar) <i>Title of the topic:</i>		
1.3	<b>Nephrology Nursing I</b> (Journal Club) <i>Title of the topic:</i>		
1.4	<b>Nephrology Nursing II</b> (Clinical Seminar) <i>Title of the topic:</i>		
1.5	<b>Nephrology Nursing II</b> (Journal Club) <i>Title of the topic:</i>		
<b>2</b>	<b><i>Clinical Rounds (with Nursing Staff, Faculty, Students) - Clinical/Case Presentation</i></b> <i>(Written reports are for submission)</i>		
2.1	<b>Foundations of Nephrology Nursing</b> (Family Education/Counseling) - Written Report <i>Name of topic:</i>		
2.2	<b>Foundations of Nephrology Nursing</b> (Clinical/Care Pathway) <i>Name of topic:</i>		
2.3	<b>Nephrology Nursing I</b> (Clinical Presentation) <i>Name of clinical condition:</i>		
2.4	<b>Nephrology Nursing I</b> (Case Study Report) <i>Name of clinical condition:</i>		
2.5	<b>Nephrology Nursing II</b> (Clinical Presentation) <i>Name of clinical condition:</i>		
2.6	<b>Nephrology Nursing II</b> (Case Study Report) <i>Name of clinical condition:</i>		
2.7	<b>Drug Studies (drugs listed under Standing Orders)</b> <i>Bedside Presentation (Five written reports)</i>		
	<i>Name of drug:</i>		
2.8	<i>Name of drug:</i>		
2.9			
2.10			
2.11			
2.12			
2.13			
2.14			
2.15			
2.16			
<b>3</b>	<b><i>Interdisciplinary Clinical Rounds (with ICU Doctors) - Clinical/Case Presentation</i></b>		
3.1	<b>Nephrology Nursing I</b>		
	<i>Name of clinical condition:</i>		
3.2			
3.3			
3.4			
3.5	(Case Study Report)		
3.6	<b>Nephrology Nursing II</b>		
3.7			
3.8			

<b>S.No.</b>	<b>Clinical Requirement</b>	<b>Date</b>	<b>Signature of the Preceptor/Faculty</b>
3.9	(Case Study Report)		
3.10	Written Report (Developed Clinical/Care Pathway)		

**Note:** Clinical presentation can be written for case study report.

**Signature of the Program Coordinator/Faculty**

**Signature of the HOD/Principal**

**CLINICAL EXPERIENCE DETAILS**

<b>Name of Clinical Area</b>	<b>Clinical Condition</b>	<b>No. of days care given</b>	<b>Signature of Faculty/Preceptor</b>

**Signature of the Program Coordinator/Faculty**

**Signature of the HOD/Principal**

**Appendix-5  
STANDING ORDERS AND PROTOCOLS**

Nurse Practitioners in Nephrology Nursing are prepared and qualified to assume responsibility and accountability for the care of patients with nephrology conditions. They collaborate with physicians, surgeons and specialists to ensure accurate therapy for patients with high acuity needs. On completion of the program, the Nurse Practitioners will be permitted to administer drugs listed in standing orders as per the institutional standing orders. They will also be permitted to order diagnostic tests/procedures and therapies as per institutional protocols.

**STANDING ORDERS**

The following intravenous injections or infusions may be administered by the Nurse Practitioner during emergency in nephrology ward/Dialysis unit or renal transplant Unit without a written order.

**Catecholamines**

- 1. Adrenaline
- 2. Noradrenaline
- 3. Dopamine
- 4. Dobutamine

**Antidysrhythmic**

- 5. Adenosine
- 6. Amiodarone

7. Lidocaine/Xylocard

**Adrenergic agent**

8. Ephedrine

**Antihistamine**

9. Avil

**Antihypertensives**

**Corticosteroid**

10. Hydrocortisone

11. Dexamethasone

**Antiepileptic**

12. Levetiracetam

13. Phenytoin

14. Propofol

**Electrolytes & acid base, fluid correction agents**

15. Soda bicarbonate 8.4%

16. Soda bicarbonate 7.5%

17. Magnesium sulphate

18. Potassium chloride

19. IV Fluids - NS, DNS, 5% Dextrose

**The following investigations and therapies may be ordered by the Nurse Practitioners**

<b>Ordering Investigations</b>	<b>Ordering Therapies</b>
<ul style="list-style-type: none"><li>• ECG</li><li>• ABG</li><li>• Chest X ray</li><li>• Basic Biochemistry investigations - Hb, PCV, TIBC, WBC Total, WBC differentials, ESR, electrolytes, platelets, PT, aPTT, bleeding and clotting time, procalcitonin, D-dimer, creatinine, HbA1c, AC, PC, HDL, LDL, TIG, cholesterol total, HIV, HbsAg, HCV</li><li>• Basic Microbiology investigations - blood and urine samples for culture and sensitivity, tips of vascular access, sample from CVC site, PD catheter exit site</li></ul>	<ul style="list-style-type: none"><li>• Nebulization</li><li>• Chest physiotherapy</li><li>• Insertion and removal of urinary catheter for female patients</li><li>• TEDS</li><li>• Surgical dressing</li><li>• Starting and closing dialysis</li><li>• Application of ichthammol glycerin/magnesium sulphate dressing for thrombophlebitis/extravasation</li><li>• Pin site care for patients on external fixators</li><li>• Isometric and isotonic exercises</li><li>• Starting and closing dialysis</li><li>• Application of magnesium sulphate dressing for thrombophlebitis/extravasation</li><li>• Isometric and isotonic exercises</li><li>• Hot and cold applications</li><li>• Hot and cold supplements</li><li>• Removal of CVC, Culture from CVC and PD catheter site</li><li>• Peritoneal equilibration test</li><li>• Heparin infusion in HD</li><li>• Erythropoietin injections</li></ul>

**INSTITUTIONAL STANDING ORDERS AND PROTOCOLS**

In every hospital, the standing orders for drug administration with specific dosage to be administered during emergency situations can be made available as guidelines for NPNepN graduates. The NP students will be trained to administer these drugs under supervision by preceptors/NP faculty. The protocols for ordering selected investigations and carrying out specific therapeutic procedures can also be available in every hospital that trains NPNepN students.

**Dr. T. Dileep Kumar  
President, INC**