

NEPHROLOGY FELLOWSHIP TRAINING PROGRAM

UMDNJ/Robert Wood Johnson Medical School

The Cooper Health System

Camden, New Jersey

CURRICULUM FOR TRAINEES

Goals:

The Nephrology Fellowship Training Program aims to provide a supervised educational experience leading to the graduation of physicians who:

1. provide excellent care in the fields of Internal Medicine and Nephrology;
2. are capable of working in a variety of clinical settings, with patients from a broad cultural and socio-economic spectrum;
3. possess habits of life-long teaching and learning to build upon their knowledge, skills and professionalism, and
4. achieve competency in the six general areas of patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism, and system-based practice.

Objectives:

The specific objectives of our training program derive from the Mission statement.

1. With respect to clinical competence, the trainee will acquire:
 - a. a basic core of knowledge of clinical manifestations, pathophysiology and management of renal diseases or systemic diseases with renal manifestations. This knowledge base should include the anatomy, genetics, biochemistry, immunology, physiology, pharmacology, epidemiology, ethics, and human behavior relevant to the practice of nephrology;
 - b. clinical skill in data collection, including history-taking, physical examination, the retrieval of relevant documents and study results;
 - c. an ability to critically analyze data collected, and to integrate this analysis with the basic fund of knowledge in order to formulate appropriate differential diagnoses;
 - d. an ability to generate *appropriate* and *effective* diagnostic and therapeutic plans;
 - e. an ability to interpret diagnostic tests relevant to the practice of nephrology, including blood chemistry, hematology and serology analysis, renal imaging techniques, and imaging of vascular and peritoneal dialysis access; and to competently perform procedures central the practice of nephrology, including urinalysis, acute and maintenance hemodialysis and peritoneal dialysis and their

- variants, and renal biopsy. The trainee will understand the principles, indications, contraindications, risks, costs and benefits of these tests and procedures;
- f. an ability to treat the common and uncommon diseases found in the practice of nephrology. Such diseases will include acute and chronic renal failure, glomerular diseases, stone disease, hypertension, and fluid/electrolyte disorders. Relevant treatments will include peritoneal and hemodialysis and their variants; renal transplantation; immunosuppressant therapy; pharmacologic management of hypertension and fluid/electrolyte disorders. The trainee will understand the principles, indications, contraindications, risks, costs and benefits of these treatments and their alternatives;
 - g. an ability to perform as a consultant or as a health-care team leader;
 - f. skill in communicating with patients and their families, peers and other healthcare personnel;
 - h. qualities of professionalism and humanism including integrity, compassion and respect for patients, peers and other healthcare personnel;
 - i. skill in designing and implementing a quality improvement program in nephrology;
 - j. knowledge and expertise in clinical or bench research. Trainees will understand the design, implementation and interpretation of research studies, including critical assessment of published research and the responsible use of informed consent.
2. The graduate will be able to work with competence:
- a. as the primary health care provider in the acute inpatient setting including critical care areas, the ambulatory office, the outpatient dialysis clinic, and the emergency department;
 - b. as a consultant to other healthcare providers in the acute inpatient setting, and outpatient areas including the emergency department;
 - c. as the leader of a multidisciplinary health care team, e.g., medical director of dialysis.
3. Graduates will demonstrate their ability to be life-long learners by their:
- a. independent study habits in the acquisition of clinical and research knowledge and skills;
 - b. participation in the organization of local educational conferences;
 - c. participation in regional and national professional scientific conferences.

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Overview

First (F1) and second-year (F2) fellows rotate through inpatient clinical services according to an assigned schedule. The following table shows *model* schedules, based on four week blocks by year, for the inpatient clinical services and research rotations with their corresponding time allocation:

4-week block #	1	2	3	4	5	6	7	8	9	10	11	12	13
Year 1													
F1a	A	B	Res	Vac	Res	A	Res	B	B	A	A	Res	A
F1b	B	Res	A	A	A	Vac	A	A	Res	Res	B	A	B
F2	Vac	A	B	Txp	Txp	B	B	Res	A	B	Res	B	Res
Year 2													
F1	A	B	Res	A	Vac	A	B	A	Res	A	B	A	Res
F2a	B	Res	A	B	A	Vac	Txp	Txp	A	B	Res	B	A
F2b	Res	A	B	Txp	Txp	B	A	B	Res	VAC	A	Res	B

Res = Research

Vac = vacation

Txp = transplant

A = Consult Service

B = Academic Service

Each fellow has regularly scheduled ambulatory assignments throughout both years. Ambulatory experiences include Hemodialysis Clinic (one “shift” of patients per week), Peritoneal Dialysis Clinic (one clinic per month), Nephrology Office (one half day per week), and Transplant Clinic (two half days per week during their two month transplant rotation and one half day per week, during the following month, for a total of three months of transplant continuity experience).

All trainees not on vacation or the transplantation service are required to attend all Divisional conferences.

The four weeks of vacation typically are distributed in one-week blocks throughout the year.

Cooper Consult Service

Educational Purpose. This rotation is intended to provide the trainee with experience in the evaluation and management of the complete spectrum of nephrologic problems in hospitalized patients. The trainee spends 5-6 months on this rotation during his/her first year and 2-3 months his/her second year. Trainees are expected to show substantial progress in achieving the specific competency objectives described below by the completion of their first year. Objectives designated with a F2 will be introduced during year 1 but not be expected to be completed until year 2.

Patient Care

Goals

Fellows must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of nephrologic problems in the hospital setting. Fellows are expected to learn the practice diagnosis, care, and treatment of men and women from adolescence to old age, during all stages of illness.

Objectives

Fellows will be able to:

- efficiently and accurately collect historical, physical examination and laboratory information relevant to the practice of nephrology
- learn the indications for and interpretation of diagnostic tests used in nephrology including: ultrasound, urinalysis, serum chemistries, blood gas analysis and renal biopsy
- develop a complete differential diagnosis for common and uncommon nephrologic problems
- counsel and educate patients and their families regarding their diagnostic and therapeutic options
- implement treatment plans, and monitor the effectiveness of their interventions
- proficiently perform procedures including:
 - urinalysis; renal biopsy (F2);
 - placement of vascular access for hemodialysis (F2);
 - prescriptions for, and supervision of, acute intermittent hemodialysis (IHD) and continuous renal replacement therapy (CRRT);
 - prescriptions for, and supervision of, peritoneal dialysis (PD) for inpatients
- work with other members of the health care team, including referring physicians from other specialties, nurses, social workers and technicians, to implement a treatment plan

- learn aspects of nephrology billing (F2)
- effectively and compassionately counsel patients and family during life-altering circumstances

Assessment of competency in these skills will utilize a global faculty assessment and documentation of successful procedure performance.

Medical Knowledge

Goals

Fellows must demonstrate knowledge of the relevant established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to inpatient care in nephrology. Fellows are expected to learn the scientific method of problem solving and evidence-based decision making; and develop a commitment to lifelong learning, and an attitude of caring that is derived from humanistic and professional values.

Objectives

Fellows will know the following topics in nephrology, elaborated in the attached ***Educational Content*** document, in the sections corresponding to

- glomerular diseases;
- diabetes mellitus and diabetic nephropathy;
- hypertension;
- acute renal failure and intensive care unit nephrology;
- chronic renal failure;
- dialysis;
- acid/base disorders;
- fluid and electrolyte disorders;
- cystic and inherited diseases of the kidney;
- tubulointerstitial disease and urinary tract infections;
- disorders of divalent cation and mineral metabolism;
- renal disease in pregnancy;
- renal function testing and
- pharmacology of drugs in renal disease.

Assessment of competency in these skills will include patient surveys, mini-clinical evaluation exercises (mini CEX), multisource assessment, and global faculty assessments.

Practice- Based Learning and Improvement

Goals

Fellows must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve nephrology care based on constant self-evaluation and life-long learning.

Objectives

Fellows will be able to:

- systematically analyze practices in hospitalized patients with kidney disease, using quality improvement methods, and implement changes with the goal of practice improvement
- incorporate formative evaluation feedback into daily practice
- locate, evaluate, and apply evidence from scientific studies related to patients' health problems
- systematically analyze their own practice with the goal of continuous performance improvement
- present alternative therapeutic regimens as options to current care (F2)

Assessment of competency in these skills will include a faculty member's review of fellow's annual performance improvement project, global faculty assessment, and chart stimulated recall.

Systems Based Practice

Goals

Fellows must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care for patients with nephrologic problems. This is especially pertinent to patients with dialysis-dependent renal failure.

Objectives

Fellows will be able to:

- coordinate patient care within the health care system relevant to the field of nephrology; in particular, demonstrate ability to call upon and coordinate the skills of dialysis nurses, dietitians, social workers, and the patient's primary physician
- recognize the cost effectiveness of various dialysis modalities (IHD, CRRT, PD) in different situations
- understand the impact of healthcare financing (third-party payers, lack of insurance, under-insurance) on the resources and dispositions available to individual patients
- gain proficiency in placing patients with dialysis-dependent chronic kidney disease in outpatient dialysis clinics
- demonstrate appropriate thresholds to redirect care initiated by other members of the patient's health care team (F2)

Assessment of competency in these skills will include multisource assessment and global faculty review.

Professionalism

Goals

Fellows must demonstrate a commitment to the professional standards of compassion, excellence and adherence to ethical principles.

Objectives

Fellows will be able to:

- care for patients, and interact with their families, with compassion, integrity, and respect, without regard to differences in culture, ethnicity, gender, sexual orientation or ability to pay
- prioritize patient autonomy at all times, especially with regard to withholding or withdrawing life-supporting treatment
- interact with colleagues cordially, respectfully and responsibly, including attending conferences in a timely and consistent manner, and honoring duty responsibilities
- assume a leadership role in Graduate Medical Education events (F2)
- strive for excellence in their own practice, research and administrative roles, and work with others to achieve excellent results for the institution

The successful attainment of these objectives will be assessed by multisource assessment, patient surveys, mini-clinical evaluation exercises (mini CEX), and global faculty assessments.

Interpersonal and Communication Skills

Goals

Fellows must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals.

Objectives

Fellows will be able to:

- communicate effectively with patients and families across a broad range of socioeconomic and cultural backgrounds
- provide effective counseling to patients and families regarding therapeutic options available to them
- consult effectively with physicians and health professionals

- maintain legible and thorough medical records
- develop team leadership and teaching skills (F2)

Assessment of competency in these skills will include patient surveys, multisource assessments, and global faculty assessments.

Principal teaching methods: Bedside faculty teaching rounds; conferences; literature review, including fixed and CD-ROM texts, and periodical literature; modeling, and direct supervision of procedures. Specific teaching methods for main education goals are summarized in **Appendix 1**.

Mix of diseases: The trainee will participate in the care of patients with fluid, electrolyte and acid-base disorders; acute and chronic renal failure including end stage renal disease (ESRD); proteinuria; hematuria; hypertension; stone disease; and pregnancy complicated by renal disease.

Patient characteristics: This service comprises patients from age 16 years onward; males and females in approximately equal numbers; occupying the general medical/surgical, pediatric, psychiatric or obstetrical floors, medical, cardiac, surgical, or trauma intensive care units at Cooper Hospital/University Medical Center.

Principal educational content: Refer to the attached **Educational Content** document for sections corresponding to glomerular diseases; diabetes mellitus and diabetic nephropathy; hypertension; acute renal failure and intensive care unit nephrology; chronic renal failure; dialysis; acid/base disorders; fluid and electrolyte disorders; cystic and inherited diseases of the kidney; tubulointerstitial disease and urinary tract infections; disorders of divalent cation and mineral metabolism; renal disease in pregnancy; renal function testing and pharmacology of drugs in renal disease.

Types of clinical encounters: Bedside patient evaluation, procedures (see below), and interaction with referring and consulting physicians.

Procedures and services: Procedures will include urinalysis, central venous catheter insertion, insertion of catheters for peritoneal dialysis, acute and chronic hemodialysis, continuous renal replacement therapy, peritoneal dialysis, and renal biopsy. Services include patient evaluation and management for consultative and concurrent care, including interpretation of diagnostic tests.

Faculty Supervision: Trainees will be supervised by the Consult Service faculty nephrologist. Trainees will be expected to triage consult requests independently, to perform independent history and physical exams, and to communicate independently with the referring team. All cases will be presented to the faculty nephrologist. Trainees' procedures, including dialysis (intermittent or continuous), urinalyses, and dialysis catheter placements will be supervised by the faculty physician until the fellows are determined to be capable of performing the procedures independently. All kidney biopsies will be directly supervised by a faculty physician.

Ancillary educational materials: The trainee will use fixed and CD-ROM texts, and articles provided or suggested by the faculty or derived from computer-assisted literature searches of periodical literature.

Evaluation: Trainees are evaluated by the faculty using a combination of a multisource assessment (including assessments by patients, nursing staff, dietary staff, and housestaff), chart-stimulated recall, medical record review, procedure logs, mini-clinical evaluation exercises (mini CEX) and global faculty assessment as described in each competency section. Written evaluations are recorded on the ABIM-approved form for evaluation of nephrology trainees.

Appendix 1 summarizes the evaluation technique used for main educational goals.

Cooper Academic Service

This rotation supplements the Cooper Consult Service by providing continued experience in the evaluation and management of the complete spectrum of nephrologic problems in hospitalized patients. The service involves care of the hospitalized patients in the morning, including teaching rounds with a faculty nephrologist. Afternoons are reserved for research projects, conference presentations, reading, or ancillary projects such as dedicated time for vascular access procedures. The trainee spends 2-3 months on this rotation during their first year and 4-5 months their second year. The entire inpatient experience is at Cooper University Hospital in Camden, New Jersey. Objectives and Evaluation techniques mirror those on the Cooper Consult Service (above) as well as appropriate components of the Research and Conference Experience (below).

Principal teaching methods: Bedside faculty teaching rounds; conferences; modeling; multidisciplinary rounds; literature review, including fixed and CD-ROM texts, and assessment of periodical literature; and direct supervision of procedures. Specific teaching methods for main education goals are summarized in **Appendix 1**.

Mix of diseases: The trainee will participate in the care of patients with fluid, electrolyte and acid-base disorders; acute and chronic renal failure including end stage renal disease (ESRD); proteinuria; hematuria; hypertension; stone disease; and pregnancy complicated by renal disease.

Patient characteristics: Patients include adolescents over age 16, and adults; males and females in approximately equal numbers; occupying general medical/surgical, pediatric, psychiatric or obstetrical floors, medical, cardiac, surgical, or trauma intensive care units.

Principal educational content: Refer to the attached **Educational Content** document for sections corresponding to diabetes mellitus and diabetic nephropathy; hypertension; intensive care unit nephrology; chronic renal failure; dialysis; acid/base disorders; fluid and electrolyte disorders; disorders of divalent cation and mineral metabolism; renal disease in pregnancy; and pharmacology of drugs in renal disease.

Types of clinical encounters: Bedside patient evaluation, procedures (see below), interaction with referring and consulting physicians.

Procedures and services: Procedures will include central venous catheter insertion, insertion of catheters for peritoneal dialysis, chronic hemodialysis, continuous hemodialysis, and peritoneal dialysis. Services include patient evaluation and management for consultative and concurrent care, including interpretation of diagnostic tests.

Ancillary educational materials: The trainee will use fixed and CD-ROM texts, and articles provided or suggested by the faculty or derived from computer-assisted literature searches of periodical literature, and participation in a regional conference on home-based dialysis modalities.

Faculty Supervision: Trainees will be supervised by a faculty nephrologist. Trainees will be expected to triage consults independently, to perform independent history and physical exams, and to communicate independently with the referring team. All cases will be presented to the faculty nephrologist. Trainees' procedures, including dialysis (intermittent or continuous) and dialysis catheter placements will be supervised by the faculty nephrologist until the fellows are determined to be capable of performing the procedures independently.

Evaluation: Trainees are evaluated by the faculty using a combination of a multisource assessment (including assessments by patients, nursing staff, dietary staff, and housestaff), chart-stimulated recall, medical record review, procedure logs, mini-clinical evaluation exercises (mini CEX) and global faculty assessment as described in each competency section. Written evaluations are recorded on the ABIM-approved form for evaluation of nephrology trainees. **Appendix 1** summarizes the evaluation techniques used for main educational goals.

Transplantation Service

This rotation provides the trainee with their primary exposure to inpatient transplant nephrology. Trainees rotate during their second year for two consecutive months; the rotation includes an outpatient transplant continuity clinic which runs an additional 4 weeks yielding a total clinic duration of 12 weeks. The rotation occurs at the Hospital of the University of Pennsylvania, Philadelphia, Pennsylvania. The trainees receive education and supervision from the faculty of the Division of Nephrology at the University of Pennsylvania. Trainees are expected to complete the specific competency objectives described below; as the rotation occurs during the second year all competencies are expected to be achieved during that time period.

Patient Care

Goal

Fellows must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health. Fellows are expected to learn the practice of health promotion, disease prevention, diagnosis, care, and treatment of men and women from adolescence to old age as relates to kidney transplantation.

Objectives

Fellows will be able to:

- efficiently and accurately collect historical, physical examination and laboratory information on patients prior to, during, and after their transplant experience
- learn the indications for and interpretation of diagnostic tests used in transplant nephrology including assessments of immunologic status, immunosuppressive medication levels, renal flow scans, and renal biopsies
- develop a complete differential diagnosis for alterations in kidney function in the kidney transplant population
- counsel and educate patients and their families regarding their diagnostic and therapeutic options
- implement treatment plans and monitor the effectiveness of their interventions including timing of appropriate follow-up in transplant clinic
- proficiently perform procedures including urinalysis, renal biopsy, prescriptions for acute intermittent hemodialysis and continuous renal replacement therapy (CRRT)
- work with other members of the health care team, including transplant surgeons, nurses, social workers and technicians to implement a treatment plan

Assessment of competency in these skills will utilize a global faculty assessment and documentation of successful procedure performance.

Medical Knowledge

Goal

Fellows must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. Fellows are expected to learn the scientific method of problem solving, evidence-based decision making, a commitment to lifelong learning, and an attitude of caring that is derived from humanistic and professional values.

Objectives

Fellows will know the following topics in transplant nephrology, elaborated in the attached ***Educational Content*** document, in the sections corresponding to

- Immunology/Immunogenetics
- Transplant Pharmacology
- Organ Sharing and Allocation
- Clinical Kidney and Pancreas Transplantation
- Infectious diseases in transplantation: pre- and post-transplantation
- Pregnancy and transplantation
- Cancer and transplantation
- Ethics of transplantation
- Economics of transplantation

Assessment of competency in these skills will include global faculty assessments.

Practice- Based Learning and Improvement

Goal

Fellows must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve nephrology care based on constant self-evaluation and life-long learning.

Objectives

Fellows will be able to:

- fellows will be able to locate, evaluate, and apply evidence from scientific studies related to patients' health problems
- systematically analyze their own practice with the goal of continuous performance improvement
- present alternative therapeutic regimens as options to current care (F2)
- incorporate formative evaluation feedback into daily practice

Assessment of competency in these skills will include global faculty assessment.

Systems Based Practice

Goal

Fellows must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care.

Objectives

Fellows will be able to:

- develop expertise in the art of consultation and communication with his/her colleagues
- demonstrate appropriate thresholds to redirect care initiated by other members of the patient's health care team (F2)
- coordinate patient care of the transplant patient including the efficient use of other members of the health care team including dietitians, social workers, nurses, and transplant surgeons

Assessment of competency in these skills will include global faculty review.

Professionalism

Goal

Fellows must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles.

Objectives- Fellows will be able to:

- care for patients, and interact with their families, with compassion, integrity, and respect, without regard to differences in culture, ethnicity, gender, sexual orientation or ability to pay
- prioritize patient autonomy at all times, and especially with regard to withholding or withdrawing life-supporting treatment
- interact with colleagues cordially, respectfully and responsibly, including attending conferences in a timely and consistent manner, and honoring duty responsibilities
- strive for excellence in their own practice, research and administrative roles, and work with others to achieve excellent results for the institution

The successful attainment of these objectives will be assessed by global faculty assessments.

Interpersonal and Communication Skills

Goal

Fellows must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals.

Objectives

Fellows will be able to:

- communicate effectively with patients and families across a broad range of socioeconomic and cultural backgrounds
- provide effective counseling to patients and families regarding therapeutic options available to them
- consult effectively with physicians and health professionals
- maintain legible and thorough medical records
- develop team leadership and teaching skills

Assessment of competency in these skills will include global faculty assessments.

Educational value: At the completion of the fellows' training, he/she is expected to understand basic transplant immunology, and be competent in the diagnosis and management of renal transplantation, acute and chronic rejection, evaluation of living related donors, surgical complications of donation and implantation of kidney allografts, including bleeding, infection, immunosuppression as well as vascular and genitourinary complications. A comprehensive understanding of immunosuppressive therapy and their rationale for use, as well as complications of specific commonly used anti-rejection medications is expected. Trainees are expected to develop skills in collaborative practice as part of the multidisciplinary transplant team.

Principal teaching methods: Bedside faculty teaching rounds; conferences; literature review, including fixed and CD-ROM texts, and assessment of periodical literature; and direct supervision of procedures.

Mix of diseases: The trainee will participate in the care of allograft recipients before and after renal transplantation, both living-related and cadaveric. They will also participate in the care of living donors before and after surgery. As part of this care, the trainee will evaluate patients with fluid, electrolyte and acid-base disorders; chronic renal failure and acute renal failure, including allograft rejection; proteinuria; hematuria; hypertension; infectious, hematologic, neurologic, cardiac, gastrointestinal, pulmonary and neoplastic complications of immunosuppression.

Patient characteristics: Patients include adolescents and adults; males and females in approximately equal numbers; inpatients and outpatients.

Principal educational content: Refer to the attached ***Educational Content*** document for sections corresponding to transplantation; diabetes mellitus and diabetic nephropathy; hypertension; acute renal failure and intensive care unit nephrology; chronic renal failure; dialysis; acid/base disorders; fluid and electrolyte disorders; cystic and inherited diseases of the

kidney; tubulointerstitial disease and urinary tract infections; renal disease in pregnancy; disorders of divalent cation and mineral metabolism; renal function testing and pharmacology of drugs in renal disease.

Types of clinical encounters: Bedside patient evaluation, procedures (see below), ambulatory nephrology.

Procedures and services: Procedures will include urinalysis, central venous catheter insertion, insertion of catheters for peritoneal dialysis, acute and chronic hemodialysis, continuous hemodialysis, peritoneal dialysis, plasmapheresis and renal biopsy. Services include patient evaluation and management for consultative and concurrent care, including interpretation of diagnostic tests.

Ancillary educational materials: The trainee will use fixed and CD-ROM texts, and articles provided or suggested by the faculty or derived from computer-assisted literature searches of periodical literature.

Faculty Supervision: Trainees will be supervised by the faculty transplant nephrologist. Trainees will be expected to triage patients independently, to perform independent history and physical exams, and to communicate independently with the other members of the transplant team. All cases will be presented to the faculty nephrologist for management and recommendations. All kidney biopsies will be supervised by an faculty physician.

Hemodialysis Continuity Clinic

Fellows participate in an outpatient Dialysis Clinic throughout their 2 year fellowship during all rotations except the transplant blocks. Duration is approximately 1/3 day per week. The rotation occurs at the Davita Dialysis Unit, Cherry Hill, New Jersey which is a 15 minute drive from Cooper University Hospital. The supervising physicians are all faculty members of the Cooper University Hospital Division of Nephrology. Trainees are expected to show substantial progress in achieving the specific competency objectives described below by the completion of their first year. Objectives designated with a F2 will be started during year 1 but not be expected to be completed until year 2.

Patient Care

Goal

Fellows must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health. Fellows are expected to learn the practice of health promotion, disease prevention, diagnosis, care, and treatment of men and women from adolescence to old age, during health and all stages of illness.

Objectives

Fellows will be able to:

- efficiently and accurately collect historical, physical examination and laboratory information relevant to the care of dialysis-dependent renal failure
- learn the indications for and interpretation of diagnostic tests used including angiography and other modalities of vascular access assessment
- counsel and educate patients and their families regarding their potential risks and benefits from a kidney transplant (F2)
- implement treatment plans and monitor the effectiveness of their interventions
- work with other members of the health care team, including referring physicians from other specialties, nurses, social workers and technicians to implement a treatment plan

Assessment of competency in these skills will utilize a global faculty assessment.

Medical Knowledge

Goal

Fellows must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. Fellows are expected to learn the scientific method of problem solving, evidence-based decision making, a commitment to lifelong learning, and an attitude of caring that is derived from humanistic and professional values.

Fellows will know the following topics in nephrology, elaborated in the attached ***Educational Content*** document, in the sections corresponding Hemodialysis, including:

- prescriptions
- complications
- co-morbid conditions
- water filtration
- adequacy assessment techniques

Assessment of competency in these skills will include patient global faculty assessments.

Practice- Based Learning and Improvement

Goal

Fellows must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve nephrology care based on constant self-evaluation and life-long learning.

Objectives

Fellows will be able to:

- incorporate formative evaluation feedback into daily practice
- locate, evaluate, and apply evidence from scientific studies related to patients' health problems
- systematically analyze their own practice with the goal of continuous performance improvement
- present alternative therapeutic regimens as options to current care (F2)

Assessment of competency in these skills will include global faculty assessment

Systems Based Practice

Goal

Fellows must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care.

Objectives

Fellows will be able to:

- coordinate patient care within the health care system relevant to the field of nephrology; in particular, demonstrate ability to call upon and coordinate the skills of dialysis nurses, dietitians, social workers, and the patient's primary physician

- understand the impact of healthcare financing (third-party payers, lack of insurance, under-insurance) on the resources and dispositions available to individual patients
- demonstrate an understanding of the process of initiating outpatient dialysis from a medical, administrative, and social perspective
- demonstrate appropriate thresholds to redirect care initiated by other members of the patient's health care team (F2)
- demonstrate an ability to apply constructive criticism, for management of current and future cases, to members of health care team (F2)
- demonstrate an understanding of evaluation and treatment of vascular accesses in particular the efficient use of Interventional Radiology and Vascular Surgery (F2)

Assessment of competency in these skills will include global faculty review.

Professionalism

Goal

Fellows must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles.

Objectives

Fellows will be able to:

- care for patients, and interact with their families, with compassion, integrity, and respect, without regard to differences in culture, ethnicity, gender, sexual orientation or ability to pay
- prioritize patient autonomy at all times, and especially with regard to withholding or withdrawing life-supporting treatment
- interact with colleagues cordially, respectfully and responsibly, including attending conferences in a timely and consistent manner, and honoring duty responsibilities

The successful attainment of these objectives will be assessed by mini-clinical evaluation exercises (mini CEX) and global faculty assessments.

Interpersonal and Communication Skills

Goal

Fellows must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals.

Objectives

Fellows will be able to:

- communicate effectively with patients and families across a broad range of socioeconomic and cultural backgrounds
- provide effective counseling to patients and families regarding therapeutic options available to them
- consult effectively with physicians and health professionals
- maintain legible and thorough medical records
- develop team leadership and teaching skills (F2)

The successful attainment of these objectives will be assessed by mini-clinical evaluation exercises (mini CEX) and global faculty assessments.

Educational Value: This experience is intended to allow the trainees to develop expertise in the diagnosis and management of problems in patients undergoing maintenance hemodialysis for end-stage renal disease.

Principal teaching methods: The trainee will make rounds with a supervising faculty member. He/she will be responsible for the care of one shift of hemodialysis patients continuously throughout his/her training. Teaching will be patient-focused on rounds. Teaching methods will also include review of pertinent literature, including fixed and CD-ROM texts, and assessment of periodical literature.

Mix of diseases: All patients will be undergoing maintenance hemodialysis for end-stage renal disease. There is a high prevalence of comorbidities in this population, including cardiovascular, gastrointestinal, pulmonary, endocrine, hematologic, neurologic, dermatologic, neoplastic and psychiatric disease.

Patient characteristics: This service comprises patients from age 18 years onward; males and females in approximately equal numbers.

Principal educational content: Refer to the attached ***Educational Content*** document for sections corresponding to dialysis; glomerular diseases; diabetes mellitus and diabetic nephropathy; hypertension; acid/base disorders; fluid and electrolyte disorders; cystic and inherited diseases of the kidney; disorders of divalent cation and mineral metabolism; renal disease in pregnancy; and pharmacology of drugs in renal disease.

Types of clinical encounters: Regular rounds on patients undergoing maintenance hemodialysis; interaction with referring and consulting physicians; interaction with family members; collaboration with dialysis nurses, technicians, dietitians and social workers.

Procedures and services: The predominant procedure will be maintenance hemodialysis. Services include ordering and interpretation of diagnostic tests, including those used for assessment of dialysis adequacy, patency and adequacy of vascular access, evaluation and management of anemia and metabolic bone disease, as well as prevalent comorbidities. For many patients on this service, the trainee serves as the principal care provider and, as such, coordinates the total care of the patient.

Ancillary educational materials: The trainee will be use fixed and CD-ROM texts, and articles provided or suggested by the faculty or derived from computer-assisted literature searches of periodical literature. For clinical practice standards, fellows are referred to the NKF-sponsored Kidney Disease Outcomes Quality Initiative guidelines at <http://www.kidney.org/professionals/kdoqi/guidelines.cfm>

Peritoneal Dialysis Continuity Clinic

Fellows participate in an outpatient Peritoneal Dialysis Clinic ½ day month throughout their 2 year fellowship, except during the transplant rotation. The rotation occurs at the Davita Dialysis Unit, Cherry Hill, New Jersey which is a 15 minute drive from Cooper University Hospital. The supervising faculty include Drs. Ron Zanger and Seema Sikand; both are members of the Cooper University Hospital Division of Nephrology. Trainees are expected to show substantial progress in achieving the specific competency objectives described below by the completion of their first year. Objectives designated with a F2 will be introduced during year 1 but not be expected to be completed until year 2.

Patient Care

Goal

Fellows must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health. Fellows are expected to learn the practice of health promotion, disease prevention, diagnosis, care, and treatment of men and women from adolescence to old age, during health and all stages of illness.

Objectives

Fellows will be able to:

- efficiently and accurately collect historical, physical examination and laboratory information relevant to the care of peritoneal dialysis patients
- learn the indications for and interpretation of diagnostic tests including those evaluating adequacy and catheter function (F2)
- counsel and educate patients and their families regarding their potential risks and benefits from a kidney transplant (F2)
- implement treatment plans, and monitor the effectiveness of their interventions

Assessment of competency in these skills will utilize a global faculty assessment.

Medical Knowledge

Goal

Fellows must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. Fellows are expected to learn the scientific method of problem solving, evidence-based decision making, a commitment to lifelong learning, and an attitude of caring that is derived from humanistic and professional values.

Fellows will know the following topics in nephrology, elaborated in the attached ***Educational Content*** document, in the sections corresponding Peritoneal Dialysis, including:

- prescription
- complications
- renal failure associated anemia
- renal osteodystrophy
- adequacy assessment techniques

Assessment of competency in these skills will include patient global faculty assessments.

Practice- Based Learning and Improvement

Goal

Fellows must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve nephrology care based on constant self-evaluation and life-long learning.

Objectives

Fellows will be able to:

- incorporate formative evaluation feedback into daily practice
- locate, evaluate, and apply evidence from scientific studies related to patients' health problems
- systematically analyze their own practice with the goal of continuous performance improvement
- present alternative therapeutic regimens as options to current care (F2)

Assessment of competency in these skills will include global faculty assessment

Systems Based Practice

Goal

Fellows must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care.

Objectives

Fellows will be able to:

- coordinate patient care within the health care system relevant to the field of nephrology; in particular, demonstrate ability to call upon and coordinate the skills of dialysis nurses, dietitians, social workers, and the patient's primary physician

- understand the impact of healthcare financing (third-party payers, lack of insurance, under-insurance) on the resources and dispositions available to individual patients
- demonstrate an understanding of the process of initiating outpatient peritoneal dialysis from a medical, administrative, and social perspective
- demonstrate appropriate thresholds to redirect care initiated by other members of the patient's health care team (F2)
- demonstrate an ability to apply constructive criticism, for management of current and future cases, to members of health care team (F2)
- demonstrate an understanding of evaluation and treatment of access problems in particular the efficient use of Interventional Radiology and General Surgery (F2)

Assessment of competency in these skills will include global faculty review.

Professionalism

Goal

Fellows must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles.

Objectives

Fellows will be able to:

- care for patients, and interact with their families, with compassion, integrity, and respect, without regard to differences in culture, ethnicity, gender, sexual orientation or ability to pay
- prioritize patient autonomy at all times, and especially with regard to withholding or withdrawing life-supporting treatment
- interact with colleagues cordially, respectfully and responsibly, including attending conferences in a timely and consistent manner, and honoring duty responsibilities

The successful attainment of these objectives will be assessed by mini-clinical evaluation exercises (mini CEX) and global faculty assessments.

Interpersonal and Communication Skills

Goal

Fellows must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals.

Objectives

Fellows will be able to:

- communicate effectively with patients and families across a broad range of socioeconomic and cultural backgrounds
- provide effective counseling to patients and families regarding therapeutic options available to them
- consult effectively with physicians and health professionals
- maintain legible and thorough medical records
- develop team leadership and teaching skills (F2)

The successful attainment of these objectives will be assessed by mini-clinical evaluation exercises (mini CEX) and global faculty assessments.

Educational Value: This experience is intended to allow the trainees to develop expertise in the diagnosis and management of problems in patients undergoing maintenance peritoneal for end-stage renal disease.

Principal teaching methods: Along with a supervising faculty member, the trainee will see patients undergoing maintenance peritoneal dialysis during their regular monthly visit. The trainee will be responsible for the care of a cohort of peritoneal dialysis patients continuously throughout his/her training. Teaching will be patient-focused during the monthly visit. Teaching methods will also include review of pertinent literature, including fixed and CD-ROM texts, and assessment of periodical literature. At each clinic session, the trainee will be responsible for presenting a synopsis of selected literature on an assigned topic related to peritoneal dialysis.

Mix of diseases: All patients will be undergoing maintenance peritoneal dialysis for end-stage renal disease. There is a high prevalence of comorbidities in this population, including cardiovascular, gastrointestinal, pulmonary, endocrine, hematologic, neurologic, dermatologic, neoplastic and psychiatric disease.

Patient characteristics: This service comprises patients from age 18 years onward; males and females in approximately equal numbers.

Principal educational content: Refer to the attached *Educational Content* document for sections corresponding to dialysis; glomerular diseases; diabetes mellitus and diabetic nephropathy; hypertension; acid/base disorders; fluid and electrolyte disorders; cystic and inherited diseases of the kidney; disorders of divalent cation and mineral metabolism; renal disease in pregnancy; and pharmacology of drugs in renal disease.

Types of clinical encounters: Regular office visits with patients undergoing maintenance peritoneal dialysis; interaction with referring and consulting physicians; interaction with family members; collaboration with dialysis nurses, dietitians and social workers.

Procedures and services: The predominant procedure will be maintenance peritoneal dialysis. Services include ordering and interpretation of diagnostic tests, including those used for assessment of dialysis adequacy, diagnosis of peritonitis and infections associated with

peritoneal access catheters, evaluation and management of anemia and metabolic bone disease, as well as prevalent comorbidities. For many patients on this service, the trainee serves as the principal care provider and, as such, coordinates the total care of the patient.

Ancillary educational materials: The trainee will be use fixed and CD-ROM texts, and articles provided or suggested by the faculty or derived from computer-assisted literature searches of periodical literature. For clinical practice standards, fellows are referred to the NKF-sponsored Kidney Disease Outcomes Quality Initiative guidelines at <http://www.kidney.org/professionals/kdoqi/guidelines.cfm>

Ambulatory Continuity Clinic

Fellows participate in an Ambulatory Continuity Clinic ½ day a week throughout their 2 year fellowship. The rotation occurs at Suite 215, 3 Cooper Plaza at the outpatient office of Cooper University Hospital. Fellows are always supervised by Cooper University Nephrology Faculty. Fellows present the cases to faculty who see all patients. Trainees are expected to show substantial progress in achieving the specific competency objectives described below by the completion of their first year. Objectives designated with a F2 will be started during year 1 but not be expected to be completed until year 2.

Patient Care

Goal

Fellows must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health. Fellows are expected to learn the practice of health promotion, disease prevention, diagnosis, care, and treatment of men and women from adolescence to old age, during health and all stages of illness.

Objectives

Fellows will be able to:

- efficiently and accurately collect historical, physical examination and laboratory information relevant to the practice of outpatient nephrology
- learn the indications for and interpretation of diagnostic tests used in nephrology including: ultrasound, urinalysis, serum chemistries, blood gas analysis and renal biopsy
- develop a complete differential diagnosis for common and uncommon nephrologic problems
- counsel and educate patients and their families regarding their diagnostic and therapeutic options,
- implement treatment plans, and monitor the effectiveness of their interventions
- demonstrate an awareness of the need and mechanisms for urgent follow-up visits (F2)
- work with other members of the health care team, including referring physicians from other specialties, nurses, social workers and technicians to implement a treatment plan
- learn aspects of nephrology billing (F2)

Assessment of competency in these skills will utilize a global faculty assessment and MINI-CEX.

Medical Knowledge

Goal

Fellows must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. Fellows are expected to learn the scientific method of problem solving, evidence-based decision making, a commitment to lifelong learning, and an attitude of caring that is derived from humanistic and professional values.

Objectives

Fellows will know the following topics in nephrology, elaborated in the attached ***Educational Content*** document, in the sections corresponding to

- glomerular diseases;
- diabetes mellitus and diabetic nephropathy;
- hypertension;
- acute renal failure and intensive care unit nephrology;
- chronic renal failure;
- dialysis;
- acid/base disorders;
- fluid and electrolyte disorders;
- cystic and inherited diseases of the kidney;
- tubulointerstitial disease and urinary tract infections;
- disorders of divalent cation and mineral metabolism;
- renal disease in pregnancy;
- renal function testing and
- pharmacology of drugs in renal disease.

Assessment of competency in these skills will include patient global faculty assessments and Chart Stimulated Recalls.

Practice- Based Learning and Improvement

Goal

Fellows must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve nephrology care based on constant self-evaluation and life-long learning.

Objectives

Fellows will be able to:

- incorporate formative evaluation feedback into daily practice
- locate, evaluate, and apply evidence from scientific studies related to patients' health problems

- systematically analyze their own practice with the goal of continuous performance improvement
- present alternative therapeutic regimens as options to current care (F2)

Assessment of competency in these skills will include global faculty assessment.

Systems Based Practice

Goal

Fellows must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care.

Objectives

Fellows will be able to:

- coordinate patient care within the health care system relevant to the field of nephrology; in particular, demonstrate ability to call upon and coordinate the skills of nurses, dietitians, social workers, and the patient's primary physician
- understand the impact of healthcare financing (third-party payers, lack of insurance, under-insurance) on the resources and dispositions available to individual patients
- demonstrate an ability to apply constructive criticism, for management of current and future cases, to members of health care team (F2)
- demonstrate an understanding of the role and mechanisms of services available to care for underinsured patients (F2)

Assessment of competency in these skills will include global faculty review.

Professionalism

Goal

Fellows must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles.

Objectives

Fellows will be able to:

- care for patients, and interact with their families, with compassion, integrity, and respect, without regard to differences in culture, ethnicity, gender, sexual orientation or ability to pay
- prioritize patient autonomy at all times, and especially with regard to withholding or withdrawing life-supporting treatment
- interact with colleagues cordially, respectfully and responsibly

- assume a leadership role in mentoring first year fellows (F2)
- strive for excellence in their own practice, research and administrative roles, and work with others to achieve excellent results for the institution

The successful attainment of these objectives will be assessed by mini-clinical evaluation exercises (mini CEX) and global faculty assessments.

Interpersonal and Communication Skills

Goal

Fellows must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals.

Objectives

Fellows will be able to:

- communicate effectively with patients and families across a broad range of socioeconomic and cultural backgrounds
- provide effective counseling to patients and families regarding therapeutic options available to them
- consult effectively with physicians and health professionals
- maintain legible and thorough medical records
- develop team leadership and teaching skills

The successful attainment of these objectives will be assessed by patient surveys, mini CEXs, and global faculty assessments.

Educational Value: This experience is intended to allow the trainees to develop expertise in the diagnosis and management of outpatients with a spectrum of nephrological problems. In addition, the trainee will develop experience communicating with his/her colleagues, and will become proficient at organizing and maintaining outpatient charts pertinent to the practice of nephrology. The second year fellow will further develop expertise in nephrology billing, the use of multidisciplinary services in the care of patients with kidney disease including but not limited to dietary and social services.

Principal teaching methods: The trainees will see outpatients under the direct supervision of the faculty nephrologist. Procedures will be performed and reviewed with the faculty nephrologist. Teaching methods will also include review of pertinent literature, including fixed and CD-ROM texts, and assessment of periodical literature.

Mix of diseases: The trainee will participate in the care of patients with fluid, electrolyte and acid-base disorders; acute and chronic renal failure (excluding end stage renal disease patients on

dialysis); proteinuria; hematuria; hypertension; stone disease; and pregnancy complicated by renal disease.

Patient characteristics: This service comprises patients from age 16 years onward; males and females in approximately equal numbers; either self-referred or referred for consultation by the general medical/surgical services, subspecialty medical/surgical services, pediatric, psychiatric, obstetrical, or family practice services.

Principal educational content: Refer to the attached *Educational Content* document for sections corresponding to glomerular diseases; diabetes mellitus and diabetic nephropathy; hypertension; acute renal failure and intensive care unit nephrology; chronic renal failure; dialysis; acid/base disorders; fluid and electrolyte disorders; cystic and inherited diseases of the kidney; tubulointerstitial disease and urinary tract infections; disorders of divalent cation and mineral metabolism; renal disease in pregnancy; renal function testing and pharmacology of drugs in renal disease.

Types of clinical encounters: New patient and established-patient office visits, interaction with referring and consulting physicians.

Procedures and services: The predominant outpatient procedure will be urinalysis. Less common procedures would include a variety of metabolic testing protocols such as water deprivation test, water loading test, tests of urinary acidification, etc. Services include patient evaluation and management for consultative and follow-up visits, including interpretation of diagnostic tests.

Ancillary educational materials: The trainee will be use fixed and CD-ROM texts, and articles provided or suggested by the faculty or derived from computer-assisted literature searches of periodical literature. For clinical practice standards, fellows are referred to the NKF-sponsored Kidney Disease Outcomes Quality Initiative guidelines at <http://www.kidney.org/professionals/kdoqi/guidelines.cfm>

Transplant Continuity Clinic

This rotation provides the trainee with their primary exposure to outpatient transplant nephrology. Trainees spend ½ day week, for a total duration of 12 weeks, during their second year. The first 2 months occur during the Transplant Inpatient Rotation. An additional 4 weeks of Clinic follow this 2 month block. The rotation occurs at the Hospital of the University of Pennsylvania, Philadelphia, Pennsylvania. The trainees receive education and supervision from the faculty of the Division of Nephrology at the University of Pennsylvania. Trainees are expected to complete the specific competency objectives described below; as the rotation occurs during the second year all competencies are expected to be achieved during that time period.

Patient Care

Goal

Fellows must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health. Fellows are expected to learn the practice of health promotion, disease prevention, diagnosis, care, and treatment of men and women from adolescence to old age as relates to kidney transplantation.

Objectives

Fellows will be able to:

- efficiently and accurately collect historical, physical examination and laboratory information relevant to the practice of outpatient transplant nephrology
- learn the indications for and interpretation of diagnostic tests used in nephrology including: ultrasound, flow scans, urinalysis, serum chemistries, and immunosuppressant levels
- develop a complete differential diagnosis for common and uncommon nephrologic problems seen in a transplant population
- counsel and educate patients and their families regarding their diagnostic and therapeutic options,
- implement treatment plans, and monitor the effectiveness of their interventions
- work with other members of the health care team, including transplant surgeons, nurses, social workers, and dieticians to implement a treatment plan

Assessment of competency in these skills will utilize a global faculty assessment.

Medical Knowledge

Goal

Fellows must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to

patient care. Fellows are expected to learn the scientific method of problem solving, evidence-based decision making, a commitment to lifelong learning, and an attitude of caring that is derived from humanistic and professional values.

Objectives

Fellows will know the following topics in transplant nephrology, elaborated in the attached ***Educational Content*** document, in the sections corresponding to:

- Immunology/Immunogenetics
- Transplant Pharmacology
- Organ Sharing and Allocation
- Clinical Kidney and Pancreas Transplantation
- Infectious diseases in transplantation: pre- and post-transplantation
- Pregnancy and transplantation
- Cancer and transplantation
- Ethics of transplantation
- Economics of transplantation

Assessment of competency in these skills will include global faculty assessments.

Practice- Based Learning and Improvement

Goal

Fellows must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve nephrology care based on constant self-evaluation and life-long learning.

Objectives

Fellows will be able to:

- incorporate formative evaluation feedback into daily practice
- locate, evaluate, and apply evidence from scientific studies related to patients' health problems
- systematically analyze their own practice with the goal of continuous performance improvement
- present alternative therapeutic regimens as options to current care (F2)

Assessment of competency in these skills will include global faculty assessment.

Systems Based Practice

Goal

Fellows must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care.

Objectives

Fellows will be able to:

- coordinate patient care within the health care system relevant to the field of nephrology; in particular, demonstrate ability to call upon and coordinate the skills of nurses, dietitians, social workers, and the transplant surgeons
- understand the impact of healthcare financing (third-party payers, lack of insurance, under-insurance) on the resources and dispositions available to individual patients
- develop expertise in the art of consultation and communication with his/her colleagues

Assessment of competency in these skills will include global faculty assessment.

Professionalism

Goal

Fellows must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles.

Objectives

Fellows will be able to:

- care for patients, and interact with their families, with compassion, integrity, and respect, without regard to differences in culture, ethnicity, gender, sexual orientation or ability to pay
- prioritize patient autonomy at all times, and especially with regard to withholding or withdrawing life-supporting treatment
- interact with colleagues cordially, respectfully and responsibly

The successful attainment of these objectives will be assessed by global faculty assessments.

Interpersonal and Communication Skills

Goal

Fellows must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals.

Objectives

Fellows will be able to:

- communicate effectively with patients and families across a broad range of socioeconomic and cultural backgrounds
- provide effective counseling to patients and families regarding therapeutic options available to them
- consult effectively with physicians and health professionals
- maintain legible and thorough medical records
- develop team leadership and teaching skills (F2)

Assessment of competency in these skills will include global faculty assessments.

Educational Value: This experience is intended to allow the trainees to develop expertise in the diagnosis and management of outpatients before and after renal transplantation. The three consecutive months in which the clinic experience occurs will ensure continuity and exposure to a wide variety of post-transplant stages including at least 20 renal transplant recipients. Trainees will learn about tissue typing and general principles of immunology, including tolerance, rejection and immunomodulation.

Principal teaching methods: The trainees will see outpatients under the direct supervision of the faculty nephrologist. Procedures will be performed and reviewed with the faculty nephrologist. Teaching methods will also include review of pertinent literature, including fixed and CD-ROM texts, and assessment of periodical literature.

Mix of diseases: The trainee will participate in the care of patients before and at various times after renal transplantation. Problems will include acute and chronic rejection, and other complications of renal transplantation, including hypertension, disorders of lipid and mineral metabolism, and infectious and neoplastic diseases.

Patient characteristics: This service comprises patients from age 18 years onward; males and females in approximately equal numbers.

Principal educational content: Refer to the attached ***Educational Content*** document for sections corresponding to transplantation; glomerular diseases; diabetes mellitus and diabetic nephropathy; hypertension; acute renal failure and intensive care unit nephrology; chronic renal failure; dialysis; acid/base disorders; fluid and electrolyte disorders; cystic and inherited diseases of the kidney; tubulointerstitial disease and urinary tract infections; disorders of divalent cation and mineral metabolism; renal disease in pregnancy; renal function testing and pharmacology of drugs in renal disease.

Types of clinical encounters: New and established-patient office visits over 3 consecutive months, and interactions with referring and consulting physicians.

Procedures and services: The predominant outpatient procedure will be urinalysis.

Ancillary educational materials: The trainee will be use fixed and CD-ROM texts, and articles provided or suggested by the faculty or derived from computer-assisted literature searches of periodical literature.

Research

Research is a vital part of the Nephrology Fellowship Training. Fellows spend 3-4 months/ year on a research block. The research occurs under the guidance of a member of the Nephrology Faculty. If requested, research can also be supervised by faculty outside of the Division of Nephrology. In these cases a written research plan must be submitted to the Nephrology Program Director. Trainees are expected to show substantial progress in achieving the specific competency objectives described below by the completion of their first year. Objectives designated with a F2 will be started during year 1 but not be expected to be completed until year 2.

Medical Knowledge

Goal

Fellows must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. Fellows are expected to learn the scientific method of problem solving, evidence-based decision making, a commitment to lifelong learning, and an attitude of caring that is derived from humanistic and professional values.

Objectives

Fellows will be able to:

- participate in and lead, when directed, Nephrology Research Conferences (F2)
- show ongoing independent investigation of medical literature in the form of periodical review and outside reading
- submit an abstract of fellow's research project to a regional or national meeting (F2)
- demonstrate an understanding of the role of research in improving patient care

Assessment of competency in these skills will include global faculty assessments.

Professionalism

Goal

Fellows must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles.

Objectives

Fellows will be able to:

- maintain Institutional Review Board (IRB) approval to participate in research projects
- prioritize patient autonomy at all times, and especially with regard to withholding or withdrawing life-supporting treatment
- interact with colleagues cordially, respectfully and responsibly, including attending conferences in a timely and consistent manner
- adhere to ethical principles when conducting research
- strive for excellence in their own practice, research and administrative roles, and work with others to achieve excellent results for the institution

The successful attainment of these objectives will be assessed by conference evaluation and global faculty assessments.

Interpersonal and Communication Skills

Goal

Fellows must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals.

Objectives

Fellows will be able to:

- develop a relationship with other members of the research team, in particular biostatisticians and research team members (F2)
- educate potential research subjects about the nature of the research, and obtain ethically sound informed consent

The successful attainment of these objectives will be assessed by conference evaluation and global faculty assessments.

Educational Value: This experience is intended to allow the trainees to develop skills in the evaluation and conduct of research. The second year fellow will be expected to submit an abstract of his or her research to a regional or national meeting.

The trainee will also be expected to design and implement one performance improvement project. Specifically, this will include identification of an area for potential intervention, analysis of the current system, an intervention, and re-analysis following the intervention. The trainee will be supported in this project by a mentor of his or her choosing. The trainee will be expected to perform a substantial amount of the annual performance improvement project during his/her research rotation.

Principal teaching methods: The trainee will participate in regular journal clubs, during which he/she will summarize and criticize research reported in original articles in the current nephrology literature. In addition, the trainee will conduct clinical research with a faculty mentor. The mentor will guide the trainee in all phases of the project (see below).

Principal educational content: Refer to the attached *Educational Content* document for sections entitled **Research Design, Methods, and Responsible Conduct**. Specifically; mentors guide the trainee in a systematic review of the relevant literature; development of a research proposal including a testable hypothesis; preparation of an informed consent form; presentation of the proposal to the Institutional Review Committee; enrollment of subjects; conduct of the research protocol; collection and recording of data; database maintenance; statistical analysis of data; deductive reasoning and data presentation; including preparation of manuscripts for publication. Emphasis is placed on the ethical conduct of research at each phase of the project.

Ancillary educational materials: The trainee will use fixed and CD-ROM texts, and articles provided or suggested by the faculty or derived from computer-assisted literature searches of periodical literature. In addition, all trainees are required to complete a course in the responsible conduct of research involving human subjects (such as the NIH course “Human Participant Protections Education for Research teams at <http://cme.nci.nih.gov>)

Conferences

Conferences are an essential component of Nephrology Fellow Training. Objectives designated with a F2 will be started during year 1 but not be expected to be completed until year 2. Below is an overview of the schedule and expected competency development as related to conferences. Following this is more specific information regarding each individual conference.

Monday	Tuesday	Wednesday	Thursday	Friday
8:00 am - 9:30 am Clinical Conference (E&R *246A)	8:00 am 1st: Basic Science 2nd: Journal Club (E&R *246A) 4th: Research Conference (E&R *246A)	4:00 pm Core Lecture Series (E&R *246A)	12:00 noon Case Conference (E&R *246A)	11:30 am Acute Dialysis (Kalemen *5N)

Medical Knowledge

Goal

Fellows must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. Fellows are expected to learn the scientific method of problem solving, evidence-based decision making, a commitment to lifelong learning, and an attitude of caring that is derived from humanistic and professional values.

Objectives

Fellows will know the following topics in nephrology, elaborated in the attached ***Educational Content*** document, as demonstrated by discussion in conferences

- glomerular diseases;
- diabetes mellitus and diabetic nephropathy;
- hypertension;
- acute renal failure and intensive care unit nephrology;
- chronic renal failure;
- dialysis;
- acid/base disorders;
- fluid and electrolyte disorders;
- cystic and inherited diseases of the kidney;
- tubulointerstitial disease and urinary tract infections;
- disorders of divalent cation and mineral metabolism;
- renal disease in pregnancy;
- renal function testing and
- pharmacology of drugs in renal disease.

Assessment of competency in these skills will include global faculty assessments and completion of Nephrology Conference Evaluation Forms.

Practice- Based Learning and Improvement

Goal

Fellows must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve nephrology care based on constant self-evaluation and life-long learning.

Objectives

Fellows will be able to:

- locate, evaluate, and apply evidence from scientific studies related to health problems presented in conferences
- present alternative therapeutic regimens as options to current care for cases under discussion (F2)

Assessment of competency in these skills will include global faculty assessments and completion of Nephrology Conference Evaluation Forms.

Systems Based Practice

Goal

Fellows must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care.

Objectives

Fellows will be able to:

- convey conference topic in larger context of clinical medicine
- participate in identifying systems errors and in implementing potential systems solutions.

Assessment of competency in these skills will include global faculty assessments and completion of Nephrology Conference Evaluation Forms.

Professionalism

Goal

Fellows must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles.

Objectives

Fellows will be able to:

- interact with colleagues cordially, respectfully and responsibly, including attending conferences in a timely and consistent manner
- strive for excellence in their own practice, research and administrative roles, and work with others to achieve excellent results for the institution

The successful attainment of these objectives will be assessed by Nephrology Conference Evaluations and global faculty assessments.

Interpersonal and Communication Skills

Goal

Fellows must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals.

Objectives

Fellows will be able to:

- develop mentoring and teaching skills

Assessment of competency in these skills will include Nephrology Conference Evaluations, and global faculty assessments.

CONFERENCE SUMMARY

a. Didactic Conferences

1) Core Curriculum Conference

Educational value: Provides the trainee with basic knowledge in the major clinical topics of nephrology, as described in the Core Curriculum. Conferences will include basic science backgrounds as well as the clinical topics. The lecture series rotates its topics from the Core Curriculum on a bi-annual basis. Copies of the lectures, in a Powerpoint format, are available for further review by trainees on the Cooper Intranet.

The Conference series includes interdisciplinary conferences with the Rheumatology, Endocrine, as well as other guest speakers. The trainees present cases and clinical updates during the Rheumatology conferences.

Specific training objectives: *

* Letters in parentheses refer to relevant core competencies: MK, medical knowledge; PC, patient care; ISC, interpersonal skills and communication; P, professionalism; PBLI, practice-based learning and improvement; SBP, systems-based practice.

- Develop comprehensive knowledge in nephrology (MK)
- Become fluent in literature review (MK, PBLI)
- Present assigned topics thoroughly, clearly and cogently (ISC, P)

Principal teaching methods: Modeling by faculty.

Principal educational content: Refer to the ***Educational Content*** document for the corresponding sections.

Ancillary educational materials: Texts and journal articles

Evaluation: Trainees are evaluated by global faculty assessment and through the use of Nephrology Conference Evaluation according to the extent of their participation, the thoroughness of their preparation, the clarity of their presentation, and the validity of their assessment.

Frequency: Weekly.

2) Journal Club

Educational value: Provides the trainees with experience critically analyzing original research and thoroughly reviewing a topic of interest.

Specific training objectives:*

- Learn to critically review current literature in nephrology (MK, PBLI)
- Develop familiarity with a variety of research methods (MK)
- Assess the applicability of new knowledge to patient care (MK, PC, PBLI)

Principal teaching methods: Modeling by faculty, and guided self-study by trainees, who rotate as presenters.

Principal educational content: Refer to the ***Educational Content*** document for the section entitled, Research Design, Methods and Responsible Conduct.

Ancillary educational materials: Texts and journal articles

Evaluation: Trainees are evaluated by global faculty assessment and through the use of Nephrology Conference Evaluation according to the extent of their participation, the thoroughness of their preparation, the clarity of their presentation, and the validity of their assessment.

Frequency: Monthly

3) Clinical Case Conference

Educational value: Provides the trainees with experience discussing and analyzing clinical scenarios from the inpatient consult service. Cases will be discussed in a case-based format, led by the trainee with faculty supervision, to include discussion of differential diagnoses, pathophysiology, and treatment options. Discussion is focused on identification of evidence-based strategies for evaluation and management.

Specific training objectives:*

- Develop an evidence-based approach to patient care (MK, PC, PBLI, P)
- Become fluent in literature review (MK, PBLI)
- Present assigned topics thoroughly, clearly and cogently (ISC, P)

Principal teaching methods: Mentored self-study by trainees, who rotate as presenters.

Principal educational content: Refer to the *Educational Content* for sections corresponding to glomerular diseases; diabetes mellitus and diabetic nephropathy; hypertension; acute renal failure and intensive care unit nephrology; chronic renal failure; dialysis; acid/base disorders; fluid and electrolyte disorders; cystic and inherited diseases of the kidney; tubulointerstitial disease and urinary tract infections; disorders of divalent cation and mineral metabolism; renal disease in pregnancy; renal function testing and pharmacology of drugs in renal disease.

Ancillary educational materials: Texts and journal articles

Evaluation: Trainees are evaluated through the Nephrology Conference Evaluation and Global Faculty Assessment as part of their Consult or Academic Service rotations reflecting their understanding of the cases in which they are involved, their discussion of differential diagnoses, and their ability to review the literature on the topic being discussed. concisely.

Frequency: Weekly

4) Pathology Conference

Educational value: Provides the trainee with an understanding of the variety of manifestations of renal diseases by correlation between clinical patient presentation and renal histopathology

Principal teaching methods: Case presentations and review of histopathology; review of the relevant literature. Trainees will make a concise presentation of the clinical case and be prepared to discuss current concepts of management of the pathologic process.

Principal educational content: Trainees will gain experience in the indications for, and interpretation of renal biopsies. They will become familiar with normal renal histology and the histologic manifestations of a variety of renal disorders. See attached *Educational Content* document for sections relating to glomerular diseases, diabetes

mellitus and diabetic nephropathy, acute renal failure, chronic renal failure, cystic and inherited diseases of the kidney, and tubulointerstitial disease.

Ancillary educational materials: Texts and journal articles

Evaluation: Trainees will be evaluated by global faculty assessment according to the depth of their preparation and the clarity of their presentation.

Frequency: Monthly

5) Research Conference

Educational value: Provides the trainees with experience critically analyzing and presenting original research

Principal teaching methods: Modeling by faculty, and mentored self-study by trainees, who rotate as presenters.

Principal educational content: Refer to the *Educational Content* document for the section entitled, Research Design, Methods and Responsible Conduct.

Ancillary educational materials: Texts and journal articles

Evaluation: Trainees are evaluated by global faculty assessment according to the extent of their participation, the thoroughness of their preparation, the clarity of their presentation, and the depth of understanding of their research motivation, methods and interpretation.

Frequency: Monthly

5) Basic Science Conference

Educational value: Provides the trainees with a foundation in renal physiology; anatomy and immunology; provides experience preparing, organizing and presenting a formal lecture.

Principal teaching methods: In-depth research of a topic in renal physiology, anatomy and immunology (see below), guided by a faculty mentor; preparation and delivery of a formal lecture on the topic.

Principal educational content: Basic anatomy and physiology of renal circulation, and glomerular filtration; sodium, potassium, calcium, magnesium and phosphorus handling by the kidney; renal acid-base regulation; water balance and renal immunology.

Ancillary educational materials: Texts and journal articles

Evaluation: Trainees are evaluated through the use of Nephrology Conference Evaluation according to the extent of their participation, the thoroughness of their preparation, the clarity of their presentation, and the validity of their assessment

Frequency: Monthly

b. Patient Management Conferences

Educational value: Exposes trainees to a variety of approaches to the management of inpatients with nephrologic problems

Principal teaching methods: Trainees present patients currently followed by the inpatient services for discussion of evaluation and management

Mix of diseases: Fluid, electrolyte and acid-base disorders; acute and chronic renal failure; proteinuria; hematuria; hypertension; stone disease; and pregnancy complicated by renal disease.

Patient characteristics: Patients include adolescents over age 16, and adults; males and females in approximately equal numbers; occupying general medical/surgical, pediatric, psychiatric or obstetrical floors, medical, cardiac, surgical, or trauma intensive care units.

Principal educational content: Refer to the attached *Educational Content* document for sections corresponding to glomerular diseases; diabetes mellitus and diabetic nephropathy; hypertension; acute renal failure and intensive care unit nephrology; chronic renal failure; dialysis; acid/base disorders; fluid and electrolyte disorders; cystic and inherited diseases of the kidney; tubulointerstitial disease and urinary tract infections; disorders of divalent cation and mineral metabolism; renal disease in pregnancy; renal function testing and pharmacology of drugs in renal disease; professionalism and ethical conduct.

Ancillary educational materials: Texts and journal articles

Frequency: Weekly

c. Multidisciplinary Dialysis Patient Care Conference

Educational value: Provides trainees with an appreciation for the contributions of the entire team of professionals caring for hospitalized patients receiving dialysis; develops the trainee's skills as a coordinator of the dialysis patient's total care

Principal teaching methods: Presentation of clinical cases; discussion with dialysis nurses, social workers, dietitians and vascular surgeons; reference to published literature regarding care of dialysis patients

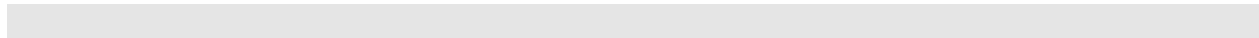
Mix of diseases: Hospitalized patients with end-stage renal disease and acute dialysis-dependent renal failure

Patient characteristics: Patients include adolescents over age 16, and adults; males and females in approximately equal numbers; occupying general medical/surgical, pediatric, psychiatric or obstetrical floors, medical, cardiac, surgical, or trauma intensive care units.

Principal educational content: Refer to the attached *Educational Content* document for sections corresponding to diabetes mellitus and diabetic nephropathy; hypertension; intensive care unit nephrology; chronic renal failure; dialysis; acid/base disorders; fluid and electrolyte disorders; disorders of divalent cation and mineral metabolism; renal disease in pregnancy; pharmacology of drugs in renal disease; and professionalism and ethical conduct.

Evaluation: Trainees are evaluated through the use of multisource assessment (Nurses, Dieticians, and Social Workers) and through the Global Faculty Assessment. The latter assesses the fellow's participation, the fellow's ability to utilize various healthcare resources, and the fellow's team leadership skills.

Frequency: Weekly



NEPHROLOGY FELLOWSHIP TRAINING PROGRAM

UMDNJ/Robert Wood Johnson Medical School

The Cooper Health System

Camden, New Jersey

CURRICULUM FOR TRAINEES

Educational Content

Glomerular Diseases

I. PROGRAM CONTENT

- A. Trainees should acquire a general understanding of the following areas:
 - 1. Structure and function of the normal glomerulus and how alterations lead to the cardinal features of glomerular injury (proteinuria and reduced GFR)
 - 2. Principal immunologic mechanisms causing human glomerular diseases and the features that distinguish them by immunofluorescence and electron microscopy
 - 3. Fundamental features of the normal immune response and an awareness of current concepts of autoimmunity and the factors that may be responsible for and mediate immunologic glomerular injury
- B. Trainees should be familiar with and develop an in-depth knowledge of:
 - 1. The causes, clinical decision making, and treatment of common and uncommon causes of hematuria and proteinuria
 - 2. Etiology and clinical findings of glomerular syndromes, including nephrosis, nephritis (including rapidly-progressive glomerulonephritis) manifesting as renal-limited processes or associated with systemic disease
- C. Trainees should develop an in-depth knowledge of idiopathic glomerular diseases with respect to pathology, clinical features, and response to treatment of:
 - 1. Minimal change nephropathy presenting in adolescents and adults, especially the response to corticosteroid treatment, the development of acute renal failure in adults, and the association with malignant tumors
 - 2. Membranoproliferative glomerulonephritis, including types I, II, and III, and the clinical and pathological features of this disorder in association with hepatitis B and C and cryoglobulinemia
 - 3. Focal segmental glomerulosclerosis (FSGS), including its various pathological and clinical syndromes and the association with conditions of reduced renal mass. The demographics, clinical course, and outcome of the clinicopathologic syndromes of “primary” focal sclerosis, including collapsing FSGS, glomerular tip lesion, and perihilar FSGS

4. Membranous nephropathy, including the clinical, pathological, and diagnostic features of both idiopathic membranous nephropathy and secondary membranous disease, and the controversies regarding treatment of this disease
5. IgA nephropathy, especially its clinical course, natural history, and prognostic markers
6. Postinfectious glomerulopathies, including bacterial, viral, parasitic, rickettsial, and fungal infections, and their epidemiology, clinical course, and response to therapy, especially with respect to HIV infections
- D. Trainees should develop an in-depth knowledge of glomerular diseases associated with systemic diseases with respect to pathology, clinical and serological features, and response to treatment of:
 1. Necrotizing and crescentic glomerulonephritis
 - a. Anti-glomerular basement membrane disease
 - b. Immune complex diseases, including lupus nephritis, postinfectious glomerulonephritis, and Henoch-Schonlein purpura
 - c. Pauci-immune glomerulonephritis and small-vessel vasculitis
 2. Renal manifestations of other rheumatic disorders, including systemic sclerosis, Sjogren's syndrome, mixed connective tissue disease, rheumatoid arthritis, Behcet's syndrome, relapsing polychondritis, and familial Mediterranean fever
 3. Renal disease in the dysproteinemias, including multiple myeloma, amyloidosis, fibrillary glomerulopathy/immunotactoid glomerulopathy, and mixed cryoglobulinemia

II. *PATIENT CARE EXPERIENCE*

- A. Trainees should be familiar with and have experience in:
 1. Diagnosis and management of patients with isolated proteinuria, hematuria, nephrotic syndrome, and acute glomerulonephritis
 2. Serological evaluation of glomerulonephritis, including the diagnostic value and limitations of antiglomerular basement membrane (anti-GBM), ANCA, antinuclear and anti-microbial antibodies, hypocomplementemia, and cryoglobulinemia
 3. Indications for and complications of renal biopsy, as well as the morphological and immunohistological features of the major glomerular diseases
 4. Treatment of patients with nephrotic syndrome and acute glomerulonephritis, both renal-limited and secondary to systemic diseases, including the indications, complications, and value of various immunosuppressive protocols

Diabetes Mellitus and Diabetic Nephropathy

I. *PROGRAM CONTENT*

- A. Trainees should acquire a general understanding of current concepts of the pathophysiology of diabetic glomerulosclerosis (DGS), including:
 1. Epidemiology and course of nephropathy in insulin-dependent diabetes mellitus (IDDM) and non-insulin-dependent diabetes mellitus (NIDDM)

2. Pathophysiologic mechanisms and histologic manifestations of diabetic nephropathy (DN)
 3. Strategies for prevention of DN
 4. Therapy of established DN
 5. Modalities of therapy for end-stage renal disease (ESRD) in DN, including hemodialysis and peritoneal dialysis, kidney transplantation, and kidney/pancreas transplantation
- B. Trainees should develop an in-depth knowledge of:
1. Various ways in which diabetes mellitus (DM) may affect the kidneys and urinary tract
 2. Cardinal clinical and histological features, as well as the epidemiology and course of DGS in patients with IDDM and NIDDM
 3. Results of clinical trials designed to prevent DN or slow its progression
 4. Relative merits of different modalities of therapy for ESRD in diabetic patients, including hemo- and peritoneal dialysis, kidney transplantation, and kidney/pancreas transplantation
- C. Trainees should be familiar with:
1. Definition, interpretation, prognostic value, and clinical use of “microalbuminuria”
 2. Unique medical and surgical problems facing patients with advanced DN as well as their management

II. PATIENT CARE EXPERIENCE

- A. Trainees must have experience in the evaluation and management of patients with progressive diabetic nephropathy, both insulin-dependent and non-insulin-dependent. Experience with treatment of blood pressure, fluid-electrolyte disorders, glycemia, and non-renal diabetic complication is needed.
- B. Trainees must have experience in the evaluation and management of patients with end-stage diabetic nephropathy who are receiving hemodialysis and peritoneal dialysis.
- C. Trainees must have experience with the evaluation of patients with diabetic nephropathy for renal transplantation.
- D. Trainees must have experience managing patients with diabetic nephropathy during and after renal transplantation.

Hypertension

I. PROGRAM CONTENT

- A. Trainees must acquire knowledge and understanding of the following areas during the course of their training:
1. Epidemiology of hypertension
 2. Pathogenesis and natural history of primary hypertension
 3. Evaluation of the hypertensive patient
 4. Nonpharmacologic therapies of hypertension
 5. Pharmacology and clinical use of antihypertensive agents

6. Hypertension in renal parenchymal disease during chronic dialysis and after renal transplantation
7. Renovascular hypertension: pathogenesis, causes, clinical features, screening and diagnostic tests, and management
8. Oral contraceptive-induced hypertension
9. Pheochromocytoma: pathophysiology, clinical features, diagnosis, and management
10. Primary aldosteronism: pathophysiology, clinical features, diagnosis, and management
11. Other forms of secondary hypertension: Cushing's syndrome, congenital adrenal hyperplasia, coarctation of the aorta, thyroid disease, hyperparathyroidism, acromegaly, sleep apnea, and drugs
12. Hypertensive emergencies and urgencies

II. PATIENT CARE EXPERIENCE

A. Trainees should be familiar with and have experience in the following areas in both the outpatient and inpatient setting:

1. Trainees must be able to assess the severity of hypertension and end-organ damage. They should be familiar with the role of ambulatory blood pressure monitoring in the evaluation of the hypertensive patient.
2. Trainees must be able to define goals of treatment, be familiar with the nonpharmacologic modalities as well as the use and side-effects of antihypertensive agents, and be able to make appropriate therapeutic choices in the context of comorbid conditions.
3. Trainees must be familiar with the management of hypertension in renal parenchymal disease during chronic dialysis and after renal transplantation.
4. Trainees must be able to identify symptoms and signs suggestive of secondary causes of hypertension and be familiar with the various screening and diagnostic tests as well as the management of these disorders.
5. Trainees must become familiar with the management of the various hypertensive emergencies and urgencies.

Acute Renal Failure and Intensive Care Unit Nephrology

I. PROGRAM CONTENT

A. Trainees must acquire knowledge and understanding of the following areas during the course of their training:

1. Normal regulation of renal and glomerular hemodynamics
2. Differential diagnosis of acute renal failure
 - a. Pathophysiology of prerenal azotemia
 - b. Pathophysiology of intrinsic renal failure, including acute glomerular diseases, acute tubular necrosis, and acute interstitial disease
 - c. Pathophysiology of obstructive renal failure
3. Mechanisms of acute renal failure (ARF) in the postoperative patient
4. Mechanisms of ARF in patients with hepatobiliary disease

5. Causes of ARF in patients with cancer and immunosuppression
6. Causes of ARF in patients with AIDS
7. Metabolic consequences of ARF
 - a. Hormonal
 - b. Nutritional
 - c. Electrolyte
 - d. Acid-base
 - e. Volume
8. Evaluation and management of ARF
 - a. Radiologic techniques in ARF
 - b. Biochemical evaluation of ARF
 - c. Role of the renal biopsy in ARF
 - d. Nondialytic therapy
 - e. Dialytic therapies
 - i. Role of hemodialysis
 - ii. Role of peritoneal dialysis
 - iii. Role of continuous therapy
9. Hemodynamic monitoring of the critically ill patient
10. Management of electrolyte/acid-base disturbances in the critically ill patient
11. Fluid management of the critically ill patient
12. Use of vasoactive drugs in the critically ill patient
13. Role of extracorporeal therapy in the management of drug overdose, specifically ethylene glycol, methanol, lithium, theophylline, salicylate, and barbiturate

II. *PATIENT CARE EXPERIENCE*

- A. Trainees must have experience in the evaluation and management of acute renal failure.
- B. Trainees must have experience in the evaluation and management of fluid-electrolyte and acid-base disturbances in the critically ill patient.
- C. Trainees should have experience in the evaluation of hemodynamics and the proper use of fluids and vasoactive drugs in critically ill patients.
- D. Trainees should have experience in the use of various dialytic techniques, including hemodialysis, peritoneal dialysis, and continuous venovenous hemodialysis.
- E. Trainees should have experience in the use of extracorporeal therapy to remove specific toxins.
- F. Trainees should have experience in the placement of central venous catheters.

Chronic Renal Failure

I. *PROGRAM CONTENT*

- A. Trainees must acquire knowledge and understanding of the following areas during the course of their training:
 1. Various etiologies of chronic renal failure (CRF)
 2. Evaluation, diagnosis, and treatment of CRF resulting from glomerular, interstitial, vascular, and obstructive processes including:

- a. Diagnosis of glomerular processes
- b. Diagnosis of interstitial processes
- c. Diagnosis of prerenal processes
- d. Diagnosis of obstructive processes
- e. Diagnosis of systemic processes that lead to CRF, specifically:
 - i. Diabetes mellitus
 - ii. Hypertension
 - iii. Ischemic renal disease
- 3. Current concepts and the results of clinical studies pertaining to the role of hypertension, dietary composition, and divalent cations on the progression of chronic renal diseases
- 4. Predialysis management of CRF with particular regard to diet, anemia, metabolic bone diseases, and drug dose adjustments
- 5. Role of anemia in patients with CRF
 - a. Management of the anemia of chronic renal failure with the use of iron, erythropoietin and other appropriate agents
- 6. Indications for initiation of ESRD therapy and placement of ESRD access in patients with CRF
- 7. Appropriate use of drugs, including dose modification, for patients with progressive CRF
- 8. Interpretation of radiographic tests, including intravenous pyelography, computed tomography, ultrasound, and radionuclide scan, in patients with CRF

II. PATIENT CARE EXPERIENCE

- A. Trainees must have at least one year of continuous outpatient clinic experience in the management of patients with CRF.
- B. Trainees must have a sufficient number of patients to evaluate and manage so that they acquire expertise in the management of patients with glomerular, interstitial, and obstructive renal processes. In addition, trainees should have a sufficient number of patients to work with to be competent in the management of hypertension, anemia, and diabetes mellitus.
- C. Trainees must be competent to interpret intravenous pyelograms, radiopharmaceutical studies, renal arteriography, and renal ultrasound in the diagnosis of patients with CRF.
- D. Trainees must be competent to perform-and must have performed a sufficient number of-percutaneous renal biopsies.
- E. Trainees must have interpreted an appropriate number of renal biopsies so that they are comfortable in reviewing histologic features and assigning appropriate diagnoses.

Dialysis

I. PROGRAM CONTENT

- A. Types, advantages, disadvantages, complications, and management of acute and chronic hemodialysis and peritoneal dialysis access; trainees must be familiar with the National Kidney Foundation *Dialysis Outcomes Quality Initiatives (DOQI)* recommendations regarding vascular access for hemodialysis

- B. Available water treatment and dialysis delivery machines for hemodialysis and connection and cycling systems for peritoneal dialysis
- C. Currently available hemodialyzers and their advantages and disadvantages, with emphasis on differences in membrane composition, biocompatibility, and solute and water flux
- D. Importance of and correct method of determining the dialysis prescription for hemodialysis and peritoneal dialysis and of monitoring the actual delivered dose of dialysis; trainees must be familiar with the *DOQI* recommendations in regard to assessing adequacy of peritoneal and hemodialysis
- E. Most common complications of hemodialysis, including hypotension, cramps, arrhythmias, hemolysis, and air embolism
- F. Most common complications of peritoneal dialysis, including peritonitis, hypotension, hernias, dialysate leaks, and inadequate dialysis
- G. Available techniques, advantages, and possible drawbacks of dialyzer reprocessing
- H. Continuous dialytic therapies, including continuous arteriovenous hemodiafiltration and continuous venovenous hemodiafiltration
- I. Nutritional considerations and management of ESRD patients
- J. Evaluation and management of complications of ESRD, including anemia (with reference to the *DOQI* recommendations), renal osteodystrophy, dialysis amyloidosis, hypertension, hyperlipidemia, and acquired cystic disease
- K. Appropriate use of drugs, including dose modifications for dialysis patients
- L. Role of Medicare, the Health Care Financing Administration, Networks, US Renal Data System, and voluntary organizations/societies (e.g., National Kidney Foundation, the ASN, and the Renal Physicians Association) in the delivery and financing of care for ESRD patients

II *PATIENT CARE EXPERIENCE*

- A. Trainees must manage patients with acute renal failure requiring dialysis treatment including intermittent hemodialysis, continuous peritoneal dialysis, and the extracorporeal continuous renal replacement therapies.
- B. Trainees must manage patients with chronic renal failure on maintenance hemodialysis longitudinally for a sufficient time to allow participation in the prescription of and monitoring of the dose of delivered dialysis, assessment and adjustment of the need for and dose of erythropoietin, evaluation and treatment of renal osteodystrophy, and ongoing evaluation of the dialysis access.
- C. Trainees must manage patients with chronic renal failure on maintenance peritoneal dialysis longitudinally as outlined above for hemodialysis patients. In addition, trainees must participate in the assessment of patients for suitability of various forms of dialytic therapy, along with a multidisciplinary team.

Acid-Base Disorders

I. PROGRAM CONTENT

A. Trainees must acquire knowledge and understanding of the following areas during the course of their training:

1. Acid-base chemistry and buffering
2. Determinants of arterial carbon dioxide tension and carbon dioxide balance
3. Determinants of plasma bicarbonate concentration and hydrogen ion balance, including renal acidification processes and the physiology of bicarbonate reabsorption, titratable acid excretion, and ammonium excretion
4. Clinical evaluation of acid-base disorders
5. Renal tubular acidosis: pathogenesis, clinical features, causes, diagnosis, and management
6. Uremic acidosis: acid-base homeostasis in ESRD
7. Other types of metabolic acidosis: pathogenesis, clinical features, causes, diagnosis, and management
8. Metabolic alkalosis: pathogenesis, clinical features, causes, diagnosis, and management
9. Respiratory acidosis: pathogenesis, clinical features, causes, diagnosis, and management
10. Respiratory alkalosis: pathogenesis, clinical features, causes, diagnosis, and management
11. Mixed acid-base disturbances

II. PATIENT CARE EXPERIENCE

A. Trainees should be familiar with and have experience in the following areas in both the outpatient and inpatient setting:

1. Trainees must assess the accuracy of the acid-base parameters and interpret serum and urine acid-base data, including the anion gap.
2. Trainees must determine from the patient's history, physical findings, and laboratory data the nature of the prevailing acid-base disorder and whether a simple or mixed acid-base disorder is present.
3. Trainees must have experience in managing renal tubular acidosis, uremic acidosis, and acid-base homeostasis in end-stage renal disease.
4. Trainees must have experience managing all other types of metabolic acidosis.
5. Trainees must have experience in the management of metabolic alkalosis.
6. Trainees must have experience in the management of respiratory acidosis and alkalosis.
7. Trainees must have experience in the management of mixed acid/base disorders.

Fluid and Electrolyte Disorders

I. PROGRAM CONTENT

A. Trainees must acquire knowledge and understanding of the following areas during the course of their training:

1. Physiology of sodium balance, including sensors of extracellular volume, effector systems, tubular sodium transport processes, and the regulation of renal sodium excretion
2. Hypovolemia: pathophysiology, causes, clinical features, diagnosis, and management
3. Edematous disorders: pathophysiology, causes, clinical features, diagnosis, and management
4. Clinical use and complications of diuretics
5. Physiology of water balance, including tonicity sensors, effector systems, the countercurrent mechanism for urine concentration, the cellular physiology of collecting duct water reabsorption, and the regulation of water excretion by the kidney
6. Hyponatremia: pathophysiology, causes, clinical features, diagnosis, and management
7. Hypernatremia: pathophysiology, causes, clinical features, diagnosis, and management
8. Evaluation and management of the polyuric patient
9. Physiology of potassium balance, including the regulation of transcellular potassium movement, tubular transport processes for potassium reabsorption and secretion, and the regulation of potassium excretion by the kidney
10. Hypokalemia: pathophysiology, causes, clinical features, diagnosis, and management
11. Hyperkalemia: pathophysiology, causes, clinical features, diagnosis, and management
12. Disorders of sodium, water, and potassium balance in end-stage renal disease

II. PATIENT CARE EXPERIENCE

A. Trainees should be familiar with and have experience in the following areas in both the outpatient and inpatient setting:

1. Trainees must be able to assess the validity and relevance of serum and urine electrolyte measurements for patient management.
2. Trainees must be able to assess volume status (including the interpretation of central venous pressure and Swan-Ganz measurements) and recognize and manage hypovolemic and edematous disorders.
3. Trainees must be familiar with the use and complications of diuretic therapy.
4. Trainees must be able to evaluate and manage hyponatremia in the acute and chronic setting.
5. Trainees must be able to evaluate and manage hypernatremia in the acute and chronic setting.
6. Trainees must be able to evaluate and manage the polyuric patient.
7. Trainees must be able to evaluate and manage the patient with hypokalemia or hyperkalemia. They must be familiar with the acute as well as the long-term management of these disorders.
8. Trainees must be able to evaluate and manage disorders of sodium, water, and potassium in patients with ESRD.

Cystic and Inherited Diseases of the Kidney

I. PROGRAM CONTENT

A. Trainees should acquire knowledge of the following areas:

1. Genetics of inherited diseases
 - a. Understanding of Mendelian genetics
 - b. Understanding of gene linkage analysis
 - c. Knowledge of chromosomal localization and characteristics of the gene responsible for the more common inherited renal disorders
2. Clinical, diagnostic and epidemiologic differences between simple, acquired, and inherited cystic disorders and their potential for renal malignancies
3. Diagnosis of inherited and cystic disease
 - a. Use of gene link analysis and mutational analysis in the screening
 - b. Role of urinalysis, renal function testing, and radiologic testing
 - c. Possibilities of prenatal diagnosis and pretest counseling
4. Approach to the symptomatic patient
 - a. Familiarity with the natural history of inherited cystic and non-cystic disease
 - b. Knowledge of clinical presentations
 - c. Familiarity with extrarenal manifestations
5. Treatment
 - a. Knowledge of strategies to manage progression of renal failure, proteinuria, and hypertension in non-cystic inherited disease
 - b. Knowledge of management of pain, hypertension, renal stone, hematuria, infection, and progressive renal failure in patients with cystic disease
 - c. Familiarity with management of extrarenal manifestation of ADPKD, including mitral valve prolapse diverticular disease, intracranial aneurysm, and hepatic cystic disease

II. PATIENT CARE EXPERIENCE

- A. Trainees should have experience in the diagnosis and management of various forms of cystic renal disease, with particular emphasis on autosomal dominant polycystic kidney disease (ADPKD) and its various renal and extrarenal complications.
- B. Trainees should have experiences in the diagnosis and management of patients with non-cystic inherited diseases, with emphasis on Alport's syndrome and its renal and extrarenal complications.
- C. Trainees should be familiar with the principles of genetic counseling of patients with inherited renal disorders.

Tubulointerstitial Disease and Urinary Tract Infections

I. PROGRAM CONTENT

- A. Trainees should acquire a general understanding of:
 1. Structure and function of the normal renal tubules and interstitium
 2. Pathophysiological mechanisms of acute and chronic interstitial diseases
 - a. Immunologically mediated interstitial nephritides
 - b. Interstitial scarring as a consequence of primary glomerular and vascular diseases
 - c. Reflux nephropathy
 - d. Obstructive nephropathy

3. Pathophysiology of interstitial disease
 - a. Immunopathogenetic and non-immune mechanisms
 - b. Relationship to glomerular function
 - c. Association with major tubular defects, including diabetes insipidus, acidification, and potassium excretion
 - d. Effects of acute and chronic urinary obstruction
4. Diagnostic procedures
 - a. Assessment of tubular defects
 - b. Evaluation of obstruction
 - c. Definition of acute and chronic interstitial nephritis
5. Pathogenesis and treatment of bacterial urinary tract infections
 - a. Major pathogenic species, routes, and course of infection
 - b. Appropriate antibiotic choices
 - c. Appropriate evaluation of the patient with multiple or resistance infections

II. PATIENT CARE EXPERIENCE

- A. Trainees should develop an in-depth knowledge of:
 1. Clinical features, causes, course, and treatment of acute allergic interstitial nephritis
 2. Clinical features, predisposing factors, complications, bacteriological profile, and treatment of acute pyelonephritis
 3. Management of patients with symptomatic and asymptomatic bacteriuria, including familiarity with
 - a. Major pathogenic species, routes, and course of infection
 - b. Appropriate antibiotic choices
 - c. Appropriate evaluation and treatment of patients with recurrent or resistant infections
 - d. Related syndromes, such as nonspecific urethritis, prostatitis, and hemorrhagic cystitis
 4. Clinical and radiological features, course, and treatment of reflux nephropathy (chronic pyelonephritis) and analgesic nephropathy, and the differential diagnosis of papillary necrosis
- B. Trainees should be familiar with:
 1. Pathological features of acute and chronic interstitial nephritides
 2. Clinical laboratory tests to evaluate aspects of tubular function, concentrating ability, urine acidification, potassium handling, and various reabsorptive functions
- C. Trainees should be aware of unusual syndromes affecting the renal interstitium, such as xanthogranulomatous pyelonephritis, lymphomatous infiltration, and various granulomatous diseases

Disorders of Divalent Cation and Mineral Metabolism

I. PROGRAM CONTENT

- A. Trainees must acquire knowledge and understanding of the following areas during the course of their training:

1. Calcium and phosphorus balance in humans
2. Renal handling of calcium, magnesium, and phosphorus
3. Physiology of calcitropic hormones, specifically parathyroid hormone, vitamin D, calcitonin, and parathyroid hormone-related peptide
4. An integrated view of calcitropic hormone regulation in normal situations and in the context of acute and chronic renal failure
5. Bone physiology
6. Methods to diagnose and treat different types of renal osteodystrophy, interpretation of bone biopsies, and an experience in the interpretation of bone biopsies in chronic renal disease
7. Pathogenesis and treatment of calcium nephrolithiasis, urate nephrolithiasis, infected stones, and cystine stones
8. Surgical procedures necessary for the treatment of stone disease

II. PATIENT CARE EXPERIENCE

A. Trainees should be familiar with, and preferably have experience in, the direct diagnosis and management of the following areas, in both an outpatient and inpatient setting:

1. Different types of renal osteodystrophy
2. Hyper- and hypocalcemia, hyper- and hypophosphatemia, and hypo- and hypermagnesemia
3. Various forms of nephrolithiasis (significant exposure)
4. Interpretation of bone biopsies

Transplantation

I. PROGRAM CONTENT

- A. Immunology/Immunogenetics
 1. Normal immune response
 2. Immune response to allografts
 3. Inflammatory response to allografts
 4. Mechanisms of tolerance
 5. Immunogenetics and tissue typing, crossmatching, and surveillance for panel-reactive antibodies
- B. Transplant Pharmacology
 1. Basic principles of pharmacology and the mechanisms of action of immunosuppressant agents, including glucocorticoids, azathioprine, mycophenolate mofetil, cyclosporine, tacrolimus, sirolimus, and monoclonal and polyclonal antibodies
 2. Basic principles of pharmacology of nonimmunosuppressive medications used in transplant for the prophylaxis of infection and the treatment of concurrent illnesses, with an emphasis on anticipating and managing drug interactions
- C. Organ Sharing and Allocation
- D. Clinical Kidney and Pancreas Transplantation
 1. Historical perspective

2. Pre-transplant evaluation of the recipient
3. Pre-transplant evaluation of the living donor
4. Pre-transplant evaluation of the cadaver donor/organ procurement
5. Surgical technique and surgical management
6. Physiology of the transplanted kidney
7. Pathogenesis and pathology of allograft dysfunction
8. Post-transplant care/in-hospital care
9. Post-transplant care/outpatient care: short- and long-term
10. Expected clinical outcomes/analysis of risk factors
11. Special considerations in pediatric renal transplantation
12. Special considerations for pancreas and kidney/pancreas transplantation
- E. Infectious diseases in transplantation: pre- and post-transplantation
- F. Pregnancy and transplantation
- G. Cancer and transplantation
- H. Ethics of transplantation
- I. Economics of transplantation

II. *PATIENT CARE EXPERIENCE*

- A. Pre-transplant: education, counseling, and evaluation of donor and recipient
- B. Immediate postoperative management: evaluation and management of extracellular fluid volume, falling urine output, and primary nonfunction of the transplanted kidney
- C. Early post-transplant management: establishment of adequate immunosuppression; diagnosis and therapy of rejection, infection, the hemolytic uremic syndrome, and urological and vascular complications; and diagnosis and management of drug interactions and toxicities
- D. Long-term post-transplant management: assessment for adequacy of immunosuppression; management of complications of long-term immunosuppression, including medication-induced allograft dysfunction, recurrence of the primary disease, de novo post-transplant glomerulonephritis, post-transplant polycythemia, avascular necrosis, dyslipidemias, glucose intolerance, liver function abnormalities, lymphoproliferative diseases, and cancers affecting the skin and other organs

Renal Disease in Pregnancy

I. *PROGRAM CONTENT*

- A. Trainees must acquire knowledge and understanding of the following areas during the course of their training:
 1. Changes in the anatomy and function of the urinary tract during pregnancy, focusing on the relevance of these changes to clinical circumstances, stressing alterations in the calyces and ureters, renal hemodynamics, and tubular function (principally potassium and glucose)
 2. Changes in acid-base metabolism in pregnancy, focusing on normal pH, HCO_3^- , and PCO_2

3. An integrated view of volume homeostasis during pregnancy. This includes knowledge of the normal gestational changes in weight, intravascular and extracellular volume status, renal salt handling, and the production of volume-regulating hormones.
4. Altered osmoregulation in pregnancy, focusing on changes in plasma sodium and osmolality levels, as well as on certain disorders of water metabolism peculiar to gestation
5. Course and control of blood pressure in normal pregnancy
6. Tests of kidney function, including indications for renal biopsy during pregnancy
7. Familiarity with the clinical spectrum and management of renal disorders in gestation. This includes: pathogenesis and treatment of urinary tract infections; acute renal failure (especially those primarily associated with gestation, i.e., septic abortion, abruption, preeclampsia, acute fatty liver, and idiopathic postpartum renal failure); and chronic glomerular and interstitial renal diseases antedating pregnancy.
8. Recognition of the presentation of stone disease during gestation and familiarity with the effect of pregnancy on patients with nephrolithiasis
9. Familiarity with the administration of both acute and chronic renal replacement therapy in pregnant women
10. Knowledge of the effects of pregnancy on the natural history of renal allografts and of the conditions required for undertaking pregnancy in transplant recipients
11. Recognition and treatment of the hypertensive disorders of pregnancy, particularly preeclampsia and its variants such as HELLP syndrome. This includes the use in gravidas of antihypertensive drugs and the prevention and treatment of eclampsia, including the administration of magnesium sulfate.
12. Capability to perform preconception counseling pertinent for the maternal and fetal prognoses for women with chronic hypertension and/or underlying kidney disorders

II. PATIENT CARE EXPERIENCE

A. Trainees must diagnose and manage women whose pregnancies are complicated by acute or chronic renal dysfunction as well as gestations complicated by hypertension. They should have exposure to the presentation and management of gravidas experiencing acute hypertensive crises, especially those crises complicated by systemic manifestations such as liver dysfunction, thrombocytopenia, and microangiopathic hemolytic anemia

Renal Function Testing

I. PROGRAM CONTENT

A. Trainees are encouraged to develop knowledge and expertise in the following areas, including indications, contraindications, complications, interpretation of results, cost effectiveness, and application to patient care of:

1. Urinalysis, including dipstick and sediment
2. Measurement of renal plasma flow and GFR, including interpretation of serum creatinine concentration and calculation of its clearance rate
3. Measurement of renal concentrating and diluting capacity
4. Measurement of microalbuminuria

5. Measurement of proteinuria, using semiquantitative and quantitative methods
6. Assessment of urinary acidification
7. Assessment of renal sodium and potassium handling
8. Renal radiology
 - a. Urography
 - b. Ultrasonography
 - c. Radionuclide scans
 - d. Computed tomography
 - e. Magnetic resonance imaging
 - f. Renal circulation imaging (angiography)

II. PATIENT CARE EXPERIENCE

A. Trainees must be given sufficient direct experience to develop expertise in their performance and interpretation of:

1. Urinalysis
2. Accurate and timed complete collection of urine for renal function testing, proteinuria, and microalbuminuria
3. Fractional excretion of electrolytes
4. Renal function clearance studies

Pharmacology of Drugs in Renal Disease

I. PROGRAM CONTENT

A. Trainees must acquire knowledge and understanding of the following areas during the course of their training:

1. Principles of drug pharmacokinetics
2. Renal handling of drugs and chemicals
3. Mechanisms of drug metabolism
4. Drug prescribing in disease states and during dialysis
5. Relevant drug-drug interactions
6. Mechanisms of drug nephrotoxicity
7. Management of drug-induced renal diseases
8. Therapeutic drug monitoring
9. Renal transplant immunosuppression

II. PATIENT CARE EXPERIENCE

A. Trainees should be familiar with, and preferably have experience in, the following areas, in both an outpatient and inpatient setting:

1. Trainees must diagnose and manage patients with different drug-induced renal syndromes.
2. Trainees should be able to prescribe for and adjust drug dosage in patients with renal dysfunction.
3. Trainees should understand indications of therapeutic drug monitoring.
4. Trainees should be able to access drug and poison information.

5. Trainees should be familiar with common overdoses and the need for extracorporeal therapy.
6. Trainees should prescribe and manage immunosuppression for renal transplantation.

Professionalism and Ethical Conduct

I. PROGRAM CONTENT

- A. Programs are encouraged to use the resource document *Project Professionalism*, from the American Board of Internal Medicine (ABIM; Philadelphia, 1995), to assist trainees in the acquisition of knowledge and understanding of the following areas during the course of training:
 1. Elements of professionalism
 - a. Altruism
 - b. Accountability, dependability, responsibility, and prudence
 - c. Excellence, but humility; continued education; commitment
 - d. Duty, justice, collegial collaboration
 - e. Honor and integrity, honesty and fidelity, trustworthiness
 - f. Respect for others, compassion, empathy
 - g. Common sense
 2. Threats to professionalism
 - a. Abuse of power and position, sexual and other harassment
 - b. Arrogance, prejudice, bias
 - c. Greed and Selfishness
 - d. Misrepresentation, clinical and scientific misconduct
 - e. Impairment, including substance abuse
 - f. Lack of conscientiousness
 - g. Conflicts of interest
- B. Methods of evaluation of professionalism and ethical conduct in trainees
 1. Utilizing ABIM peer evaluation professional associate rating forms from multiple evaluators
 2. Maintaining a critical events file documenting positive and constructive comments
 3. Expanding traditional performance evaluation forms to incorporate components of professional and ethical evaluation
 4. Providing for professionalism and ethics evaluation in research performance
 5. When necessary, providing a mechanism for remediation of professional and ethical deficiencies

Research Design, Methods, and Responsible Conduct

Trainees should become familiar with the methods and problems inherent in performing and interpreting clinical and basic science research. This will be accomplished through

participation in the design, performance, and interpretation of a research project. In addition, trainees will participate in a regularly scheduled Journal Club that critically reviews clinical and basic science articles.

I. PROGRAM CONTENT

A. Trainees must acquire knowledge and understanding of the following areas during the course of their training:

1. Hypothesis development
2. Experimental design of human, animal, or other experiments
3. Elementary statistical analysis
4. If necessary, the writing of protocols that would be submitted to the institutional review board (IRB) regulating research on humans or to the institutional animal care and use committee (IACUC)
5. Preparation of data for publication
6. Acquisition, recording, and storage of data
7. Scientific integrity and the responsible conduct of research
 - a. Protection of animal and human subjects (IRB, IACUC)
 - b. Integrity in the collection and recording of data
 - c. Integrity in the interpretation of data
 - d. Integrity in the authorship and publication
 - e. the Nuremberg Code, Helsinki Declaration, and Belmont Report
8. Scientific misconduct and fraud
 - a. Self-deception
 - b. Fabrication, falsification, and plagiarism
 - c. Conflicts of interest
 - i. Scientist-scientist relationship
 - ii. Scientist-industry relationship

II. RESEARCH EXPERIENCE

- A. Trainees working in a laboratory must develop familiarity with and a working knowledge of techniques and assays relevant to their project.
- B. Trainees working on a clinical research project should admit study subjects, participate in obtaining informed consent, and take an active role in the study.
- C. Trainees participating in clinical outcomes studies must be familiar with the methods used to acquire data and should participate in a meaningful way in the analysis of such information.
- D. Trainees should participate in the preparation of abstracts, manuscripts, or reports that originate as a result of the studies.

Appendix 1: Educational Goals, Teaching Methods, Evaluation Technique, and Competency

A and B Consult Services

Goal	Teaching Method	Eval Technique	Competency
Evaluation/ Management Renal Disease	Teaching Rounds Lit Review Conferences	Global Fac Assess. Chart Stim Recall Mini CEX	Medical Knowledge Patient Care
Consultation/ Communication	Modeling Teaching Rounds	Multisource Assess. Global Fac Assess. Mini CEX	Medical Knowledge Patient Care
Teaching Skill Development	Modeling Teaching Rounds Conferences	Multisource Assess. Global Fac Assess Conference Evaluation	Interpersonal and Commun Skills Professionalism Practiced Based Improvement
Nephrology Billing (2 nd year)	Teaching Rounds Conferences	Global Fac Assess	Systems Based Practice Medical Knowledge
Independent performance of consults (2 nd year)	Teaching Rounds Modeling	Global Fac Assess Mini CEX	Practice Based Improvement Medical Knowledge Patient Care
Team leadership	Teaching Rounds Modeling	Global Fac Assess Multisource Assess. Mini CEX	Interpersonal and Commun Skills Systems Based Practice Professionalism
Procedural Proficiency (2 nd year)	Procedural Supervision	Global Fac Assess Procedure Log	Patient Care
Performance Improvement	Multidisciplinary Rounds Teaching Rounds Literature Review	Multisource Assess. Global Fac Assess	Interpersonal and Commun Skills System Based Practice Practiced Based Improvement

Clinic (Ambulatory, Peritoneal Dialysis, Hemodialysis)

Evaluation and Management	Teaching Rounds Lit Review Conferences	Global Fac Assess. Chart Stim Recall Mini CEX	Medical Knowledge Patient Care
Consultation/ Communication	Modeling Teaching Rounds	Multisource Assess. Global Fac Assess. Mini CEX	Medical Knowledge Patient Care
Nephrology Billing (2 nd)	Teaching Rounds	Global Fac Assess	Systems Based Practice

year)	Conferences		Medical Knowledge
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Research Rotation

Design and Implementation of Research Project	Conferences Mentoring	Global Faculty Assess	Medical Knowledge System Based Practice
Performance Improvement	Multidisciplinary Rounds Teaching Rounds Literature Review	Multisource Assess. Global Fac Assess	Interpersonal and Commun Skills System Based Practice Practiced Based Improvement

Conferences

Teaching Skill Development	Modeling Teaching Rounds Conferences	Global Fac Assess Conference Evaluation	Interpersonal and Commun Skills Professionalism Medical Knowledge Practiced Based Improvement
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