

THOMAS JEFFERSON UNIVERSITY

DIVISION OF NEPHROLOGY TRAINING PROGRAM

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I. Educational Program

The Nephrology Division at Thomas Jefferson University Hospital provides a comprehensive 2-year fellowship training experience. Our overall goal is to furnish a highly structured clinical and research experience for trainees that they may develop the skills necessary to pursue successful careers in clinical nephrology and/or scientific investigation. This goal is to be accomplished under the auspices of the University, whose general mission it is to provide state-of-the-art, compassionate and cost-effective healthcare services, to teach future healthcare professionals, and to lead in the research, development and introduction of improved methods of healthcare delivery to benefit everyone.

II. Facilities and Resources

The Nephrology program at TJU includes: 2 hemodialysis centers with approximately 150 patients, a peritoneal dialysis program of approximately 30 patients, and an active renal transplant program with approximately 100 kidney and kidney/pancreas transplants performed annually. The division also operates a Center for Diabetic Kidney Disease and a CKD Management Center. The 800-bed teaching hospital has ACGME approved residencies in virtually all medical and surgical fields, and provides the opportunity for renal fellows to be involved in approximately 800-1000 clinical consultations annually. Members of the division perform approximately 200 native and transplant kidney biopsies per year with the fellows. Renal pathology provides on-campus histopathology, immunofluorescence, and electron microscopy. Excellent radiology support is provided, encompassing ultrasound, MRI, CT scanning, nuclear medicine, and interventional radiology. In addition to routine angiography, the interventional radiologists actively participate in vascular access management, including routine fistulograms, angioplasty, stent placement, and thrombectomies.

III. Formal Education

The division participates in an active conference schedule. All members of the division and the fellows are required to attend all conferences. Regular conferences include the following:

1. Journal Club- twice monthly. Attendings are responsible for selecting several papers that are reviewed in detail by the fellows. Attendings are responsible for directing the discussion with emphasis on critical review of the literature.
2. Physiology Conference- monthly. Fellows are responsible for reviewing major areas of renal physiology in depth.
3. Biopsy Conference- twice monthly. The renal pathologist presents several recent, interesting biopsy cases along with a fellow teaching case.
4. Fellow/Attending Topic Review- twice monthly. Fellows and attendings alternate in presenting detailed updates on various topics in clinical nephrology.
5. Renal Grand Rounds-monthly. Outside speakers in nephrology and related fields are invited to give talks on current issues/recent advances.
6. Patient Care conference- weekly. Difficult inpatient and outpatient cases are discussed. This conference is attended by all attendings, fellows, transplant surgeons, dietitians, renal social workers, and transplant coordinators.

Other conferences include: Weekly transplant journal club, monthly hemodialysis access conference, bimonthly bone/mineral metabolism conference, and monthly interdisciplinary conferences where psychosocial and ethical issues regarding chronic dialysis patients are discussed.

IV. Clinical Rotations

Year one. There are three hospital rotations during the first year. Each fellow spends a total of 4 months on each of the three rotations. One attending and one fellow staff each rotation.

- 1) Inpatient dialysis- The fellow will oversee the management of all dialysis patients on the primary nephrology service and will manage the renal/ dialysis care of all other chronic dialysis patients admitted to other medical/surgical services.
- 2) Inpatient transplant- The renal fellow will participate in all aspects of the transplant patient's care. The fellow will oversee the management of all transplant patients admitted to the primary nephrology service and will actively provide consultative care to all newly transplanted patients on the surgical service. The fellow will also perform transplant biopsies with the attending supervising.
- 3) Inpatient consultation- The fellow, along with medical residents and medical students assigned to this service, will provide consultative services for patients with acute renal failure, chronic renal failure, glomerular and interstitial diseases, fluid and electrolyte abnormalities, acid-bases disturbances, and hypertension.

Year two. The second year is primarily a research/ambulatory care year. However, the second year fellows will be responsible for covering the above rotations when the first year fellows go on vacation.

V. Outpatient Experience.

Year One. Each first year fellow will be assigned to one attending's outpatient clinic. The fellow will work one on one with that attending in the outpatient office ½ day per week for the duration of their fellowship training starting in January of their first year. Each fellow is also assigned to work with an attending on one outpatient dialysis shift. Shift assignments rotate quarterly for the attendings and the fellows.

Year Two. Each second year fellow will continue to spend ½ day per week with their assigned attending in the outpatient clinic and will also continue to work with an attending on one or two outpatient dialysis shifts on a rotating basis. In addition, on a rotating, quarterly basis, fellows work with attendings ½ day per week in peritoneal dialysis, transplantation, and pediatric nephrology clinic.

VI. Research Experience

During the second year, fellows participate in one ongoing basic science project and one clinical research project. Research is expected to consume approximately 60% of the second year fellow's time. Fellows are responsible for presenting their data twice during the year during basic science/research conference. Fellows are expected to write at least one abstract or other scholarly project (case report, literature review, etc.) during their second year. Presentation at scientific meetings is encouraged.

VII. Goals and Objectives

A. Dialysis. By the completion of fellowship, the trainee will have become familiar with and gained expertise in the principles, practice, and procedures of dialysis. The fellow will:

1. Understand the indications for initiation of dialysis.
2. Be familiar with the evaluation and selection of patients for chronic hemodialysis and peritoneal dialysis, including counseling regarding dialytic options.
3. Understand the relative advantages and disadvantages of hemodialysis and peritoneal dialysis.
4. Understand the indications, placement, and complications of acute hemodialysis and peritoneal dialysis catheters.
5. Be familiar with the management of permanent vascular hemodialysis accesses, including appropriate timing and placement of AV fistulae and grafts, prospective monitoring of vascular access function, and management of thrombosed or poorly functioning vascular accesses.
6. Be familiar with the management of chronic peritoneal dialysis catheters, including the choice of catheter type, management of exit site and tunnel

- infections, and the management of mechanical problems such as leaks and hernias.
7. Be familiar with the selection and maintenance of an appropriate dialysis prescription (both HD and PD) including assessment of dialysis adequacy.
 8. Be familiar with dietary issues in pre-ESRD and dialysis patients.
 9. Gain exposure to the ethical issues pertaining to dialysis patients, including the voluntary withdrawal from dialysis.
 10. Understand the evaluation and management of chronic complications of ESRD including hypertension, anemia, atherosclerotic cardiovascular disease, neuropathy, and metabolic bone disease.
 11. Be familiar with the evaluation and management of peritonitis in PD patients.
 12. Be familiar with the evaluation and management of ultrafiltration failure in PD patients.
 13. Be familiar with the principles and techniques of dialysis water treatment and dialyzer reuse.
 14. Be familiar with the characteristics and advantages of various hemodialysis membranes, including issues related to biocompatibility.
 15. Be familiar with the principles of drug dosing in all forms of dialysis.
 16. Be familiar with the principles and techniques of continuous renal replacement therapies.

B. Transplantation. By the completion of fellowship, the trainee will have become familiar with and gained expertise in the principles of renal transplantation and the management of the transplant patient. The fellow will:

1. Be familiar with the appropriate evaluation of the patient as a potential transplant candidate.
2. Be familiar with the benefits of live donor vs. cadaveric transplantation, and the risks/benefits of transplantation vs. chronic dialysis.
3. Understand the mechanisms of action and side effects of immunosuppressive agents, and also practical issues regarding the prescription of these agents such as dose monitoring and drug interactions.
4. Be familiar with the diagnosis and treatment of acute allograft rejection.
5. Be familiar with the diagnosis and management of chronic allograft nephropathy.
6. Be familiar with the histopathologic features of acute and chronic allograft rejection as well as drug toxicity.
7. Be familiar with the diagnosis and management of short and long-term complications of transplantation including post-operative complications, infection, hypertension, diabetes, malignancy, and recurrent disease in the allograft.
8. Understand the indications, benefits, and relative risks of pancreatic transplantation in the diabetic patient.
9. Understand the biology and immunology of histocompatibility testing and tissue typing.

10. Be familiar with the psychosocial issues regarding organ donation and transplantation, including attempts to deal with the shortage of donor organs.

C. Clinical Nephrology. By completion of the fellowship the trainee will:

1. Be familiar with renal anatomy and physiology in normal and aging humans.
2. Be familiar with the indications for and risks of renal biopsy.
3. Understand the pathogenesis, complications and management of glomerulonephritis and nephrotic syndrome as well as the specific disease entities associated with these syndromes. These specific disease entities include but are not limited to: minimal change disease, focal segmental glomerulosclerosis, membranoproliferative GN, membranous GN, lupus nephritis, IgA nephropathy, diabetic nephropathy, amyloidosis, myeloma kidney, crescentic GN, post-infectious GN, renal vasculitis, and the thrombotic microangiopathies.
4. Understand the pathogenesis, complications, and management of tubulointerstitial diseases of the kidney including cystic diseases.
5. Be able to recognize the histopathologic features of normal kidney and diseased kidney on light microscopy, immunofluorescent microscopy and electron microscopy. The fellow will have gained expertise in the histopathologic features of the major glomerulopathies listed above, as well as tubulointerstitial diseases such as acute tubular necrosis and interstitial nephritis.
6. Be familiar with the optimal management of essential hypertension.
7. Be familiar with the diagnosis and management of secondary hypertension.
8. Be familiar with the diagnosis and management of renal artery disease.
9. Be familiar with the diagnosis, metabolic evaluation and management of nephrolithiasis.
10. Be familiar with the pathogenesis, diagnosis, management and prevention of acute renal failure.
11. Understand the pathogenesis, complications, and management of
 - a. disorders of water handling
 - b. disorders of disorders of sodium handling
 - c. disorders of potassium balance
 - d. disorders of calcium, magnesium, and phosphorous balance
 - e. disorders of acid-base balance
 - f. urinary tract infection
 - g. isolated hematuria
 - h. non-nephrotic proteinuria
 - i. kidney disease in pregnancy
 - j. kidney disease in the elderly
12. Be able to interpret radiologic tests including IVP, ultrasound, nuclear scans, and arteriograms.

D. Systems-based practice. By the completion of the fellowship the trainee will be able to demonstrate their knowledge of the environmental context and health care system within which nephrologists function. They will be familiar with:

1. The financing structures, the organization and capacities of the various provider entities and delivery systems in renal care.
2. The tools and techniques for controlling costs and allocating resources.
3. Systems for improving quality of care
4. The roles and contributions of other professionals in caring for renal patients and populations.

E. Practice-based learning and Improvement. By the completion of fellowship the trainee will have gained the skills to apply scientific methods and analytic tools to improve their patient care practices. They will have gained expertise in:

1. The locations and appraisal of scientific evidence and clinical studies related to their patient's health problems.
2. The application of information about the populations from which their patients are drawn.
3. The analysis of practice experience in order to perform systematic improvement activities.
4. The practice of evidence based medicine.

F. Procedural Skills

1. By the end of the fellowship, the trainee is expected to be expert in the indications for, complications of, and the technique of acute hemodialysis access placement, native and transplant kidney biopsy, and urinalysis and urinary sediment interpretation. Each fellow is responsible for keeping an updated log of performed procedures.

VIII. Recommended Reading.

1. Brenner and Rector: The Kidney.
2. Burton David Rose: Clinical Physiology of Acid-Base and Electrolyte Disorders
3. Daurgidas: Handbook of Dialysis
4. Nissenson and Fine: Dialysis Therapy
5. Danovitch: Handbook of Kidney Transplantation

IX. Evaluation Process.

Fellows will be evaluated in accordance with the requirements of the Internal Medicine Residency Review Committee, American Board of Internal Medicine, and ACGME

Institutional Requirements. Evaluation of fellows will be in writing and maintained in personnel files in the department. Fellows may review their files and append comments to evaluations. Fellows may not remove evaluations from the file, copy evaluations, or alter evaluations.

Fellows are evaluated on a rotational basis. After each rotation the attending will complete a formal evaluation of the fellows performance. Areas of evaluation include fund of knowledge, overall clinical competence, interpersonal skills, and professional conduct. Summative and formative evaluation sessions are held with the Program Director semi-annually and written summaries of the sessions are maintained in the resident's file. The program director will prepare a final written evaluation of the fellows performance at the completion of fellowship training, which must be maintained indefinitely in the department, with a copy forwarded to the Office of House Staff Affairs of TJUH. This final evaluation will state that the fellow is capable of practicing Nephrology competently and independently. The Program Director also completes the annual evaluation of each resident's performance provided by the Office of the Dean.

At least annually, fellows will be requested to provide feedback on teaching by the individual attendings and on the training program in general. The program director and several members of the faculty will meet with the fellows to evaluate the curriculum, the conference schedule, and the basic organization of the teaching program in order to improve the program.

X. Lines of Supervision/Grievance Policy

The clinical fellow on inpatient service will report directly to and be supervised by the faculty attending covering that inpatient service. That faculty attending will also supervise the placement of hemodialysis catheters until the time the fellow has achieved competence in this procedure. Determination of competence will occur after several lines have been placed successfully under the direct observation of the attending and that attending feels the fellow is competent to perform this procedure in an independent fashion. All renal biopsies will be supervised by a faculty attending. Fellows in the outpatient clinics and dialysis units will report directly to and be supervised by the faculty attending assigned to that particular clinic or shift. The faculty attendings and program director are supervised by the Director of the Division of Nephrology, who in turn is supervised by the Chairmen of the Department of Medicine.

Fellow complaints or grievances which cannot be handled directly with involved attendings should be discussed directly with the fellowship program director. If satisfaction is not obtained, complaints should be directed to the Director of the Division of Nephrology.

XI. Expectations for Fellows Regarding Vacation, On call Clinical Responsibilities, Duty Hours and Moonlighting

A. Vacation.

Trainees may take up to one month per year of training for vacation time, parental or family leave, job interviews, or illness. Training must be extended to make up any absences exceeding one month per year. A fellow may not take more than 2 consecutive weeks of vacation. A written vacation schedule must be submitted to the office by July 15 of the academic year. Any changes made to this schedule later in the year must also be submitted in writing. In order to provide adequate orientation for new clinical fellows, to facilitate the transition between academic years and to provide adequate coverage of patients, second year fellows may not take vacation time in the first half of July. First year fellows may not take vacation during the month of June. Although second year fellow responsibilities do not end until June 30th, it is often difficult for them to cover clinical service during this time. Each fellow may attend one academic conference per academic year. Any days missed due to attendance at additional conferences must come out of that fellow's vacation time.

No fellow may go on vacation or be away from work for any reason without coverage. In most cases, the second year fellows will provide coverage. In unusual circumstances it may be necessary for a fellow to help cover two services. For unexpected days away from work, such as sick days, the fellow must call the attending on service and also the office (5-6550) to notify the staff that he or she will not be in and also to inform staff who will be covering his or her service.

B. Duty Hours.

The delivery of high-quality medical care does not lend itself necessarily to regular and predictable working hours. Often, the need for urgent or emergent medical assessment, or the delivery of specialized procedures such as hemodialysis arises outside of normal working hours. For this reason we use a call system for attendings and fellows. The Division of Nephrology recognizes that fellowship is demanding of both time and energy, and that the educational goals of the program and learning objectives of fellows must not be compromised by excessive reliance on fellows to fulfill service obligations. The structuring of duty hours and on-call schedules must focus on the needs of the patient, continuity of care, and the educational needs of the fellow. The on-call system is based on "normal working hours" defined generally as 8:00 am – 6:00 pm Monday through Friday. During those hours fellows are expected to be available by pager, to be on the Jefferson campus, and be ready to fulfill any urgent inpatient or outpatient responsibilities including consults, follow-ups, and procedures. In general, all fellows should complete their existing work and sign-out to the on-call fellow by 6:00 pm. If the service is light, or if necessary for other reasons, fellows can sign out early with the approval and the consent of the on-call

fellow. Attendings physicians are expected to round early enough to enable the fellow to complete his/her work and the leave the hospital by 6:00 pm.

Duty hours must be limited to 80 hours per week, averaged over a four-week period, inclusive of all in-house activities. Trainees must be provided with 1 day in 7 free from all educational and clinical responsibilities, averaged over a 4-week period, inclusive of call. In-house call must occur no more frequently than every third night, averaged over a 4-week period. Nephrology fellows do not routinely take in-house call, but rather provide at-home call. The frequency of at-home call is not subject to the every-third-night limitation. At-home call, however, must not be so frequent as to preclude rest and reasonable personal time for each fellow. Fellows taking at-home call must be provided with 1 day in 7 completely free from all educational and clinical responsibilities, averaged over a 4-week period. When fellows are called into the hospital from home, the hours residents spend in-house are counted toward the 80-hour limit. The Division of Nephrology ensures that fellows are provided appropriate backup support when patient care responsibilities are especially difficult or prolonged. An attending is always scheduled to be on call with the fellow on weeknights and weekends and is available for assistance. **(ACGME Common Program Requirements, Section VI, parts B and C.)**

C. Moonlighting

The policy of the Division of Nephrology concerning moonlighting outside the program is consistent with RRC requirements, as well as ACGME guidelines. It is the prerogative of the Chairman and Program Director to determine whether moonlighting is permitted. No fellow shall be required to engage in moonlighting. Fellows may not moonlight until they have received the applicable license for unsupervised medical practice in the state where the moonlighting occurs. Fellows will adhere to the Moonlighting Policy of the institution and the program. In all instances in which moonlighting is permitted, the permission of the program director must be obtained prior to the initiation of moonlighting and documented in writing. This documentation will be made part of the fellow's personnel file. Moonlighting activities must not interfere with the ability of the resident to achieve the educational goals and objectives of the program. Professional liability insurance coverage is not provided for any activities outside the scope of the program, and moonlighting fellows should arrange for adequate professional liability coverage for their activities. Fellows working additional shifts at Thomas Jefferson University Hospitals are insured for professional liability under their current resident policy, provided they meet the eligibility requirements, and are in compliance with procedures established by the Office of Medical Staff Affairs, as well as in compliance with the departmental, institutional, and ACGME duty hours requirements.

XII. Division Policies on Resident Selection, Promotion and Dismissal

All policies and procedures for Resident Selection, Evaluation, Promotion, and Dismissal are in compliance with both ACGME requirements and with the institutional policies and procedures of Thomas Jefferson University Hospital.

A. Resident Selection

All candidates applying to the Division of Nephrology Fellowship Program must, as a requirement for application, have successfully completed at least three years of internal medicine residency training in an ACGME-approved program. . Further, all candidates must satisfy the requirements of the State of Pennsylvania Board of Medical Licensure for appointment at the specific level of training for which the position is offered.

In addition, applicants must meet one of the following qualifications to be eligible to apply for the Nephrology Fellowship Program:

- a. Graduates of medical schools in the United States and Canada accredited by the LCME;
- b. Graduates of osteopathic medicine in the United States accredited by the AOA;
- c. Graduates of medical schools outside the United States who meet one of the following qualifications:
 1. Have received a currently valid certificate from the ECFMG; or
 2. Have a full and unrestricted license to practice medicine in an U.S. licensing jurisdiction.
- d. Graduates of medical schools outside the United States who have completed a Fifth Pathway program provided by an LCME-accredited medical school.

Resident applicants will be evaluated on the basis of their preparedness, ability, aptitude, academic credentials, communication skill, and personal qualities such as motivation, honesty, and integrity. The program does not discriminate with regard to sex, race, age, religion, color, national origin, disability, sexual orientation, or veteran status.

All prerequisite prior training must be successfully completed prior to beginning a fellowship in the Division of Nephrology.

All applications are initially reviewed by the program director. The decision to offer an interview to an applicant is made by the program director, based upon the following criteria: medical school and medical residency performance, letters of recommendation, board scores and other activities (i.e. research activity, publications).

All interviews are conducted in person. Interviews are usually conducted throughout the fall. All applicants are interviewed by several division faculty members and have the opportunity to meet with current fellows. Each faculty member completes an evaluation form commenting on the strengths/weaknesses of each candidate. After the interview process is over, all members of the division will meet to discuss each candidate, review

the interview comments, and mutually reach agreement as to which candidates will be offered positions.

All offers of employment at TJUH are contingent upon approval of the GMEC, licensure, and satisfactory completion of training in an ACGME-approved program or, where applicable, and AOA-accredited program.

B. Promotion

All fellows in the division of Nephrology are expected to successfully complete at least 24 months of training in order to successfully complete fellowship training at Jefferson and to be considered eligible for Nephrology certification by the American Board of Internal Medicine.

Fellows must develop the knowledge, skills, attitudes, behaviors and judgment to assume responsibility for independent practice of Nephrology at the completion of their education. In the Division of Nephrology the following constitute criteria for promotion:

1. The fellow must successfully complete all rotations in a satisfactory fashion. These include inpatient rotations and all outpatient rotations. The fellow must also complete their research rotation in a satisfactory fashion. Fellows receive formal evaluations of their performance on all of these rotations (See section on Fellow Evaluation).
2. The fellow must demonstrate proficiency in the procedures of renal biopsy (both native and transplant) and hemodialysis catheter insertion. A procedure log must be kept by the fellow to be reviewed by the Program Director during the fellow's semi-annual feedback session.

Residents who fail to meet the performance standards required for promotion and outlined above will receive formative as well as summative feedback concerning their performance, and be provided with the opportunity to correct or improve the deficiencies identified. The Program will maintain written documentation of these evaluations. Remediation efforts will be evaluated and documented in writing.

C. Dismissal

In the unusual circumstance where just cause exists, the Division reserves the right to recommend disciplinary action, up to and including dismissal, of the fellow. Under these circumstances, the Divisional policies are as per the House Staff Contract and the Institutional Policies and Procedures regarding Resident Performance Deficiency.