Hemodialysis and Continuous Renal Replacement therapies (CRRT)

Training in hemodialysis and CRRT is centered in both the inpatient at Albany Medical Center (AMC) and the Stratton VA Medical Center (VAMC) and outpatient at Albany Regional Kidney Center (ARKC), Albany Dialysis Center (ADC), Dialysis Center, Inc. (DCI) settings.

**Lines of Responsibility:**
Fellows report to Attending Nephrologist during this experience and if the Attending Nephrologist is unavailable, Fellows report to the Key Faculty Nephrologist on-call and ultimately to the Program Director. Fellows learn inpatient hemodialysis while on the Clinical Services at both AMC and VAMC. The Fellows learn to write orders for inpatients requiring hemodialysis, determines the proper dialysate bath, anticoagulation protocol, fluid removal amount, time on hemodialysis, blood flow rate, and the need for sodium modeling. These orders are written under the supervision of the Attending physician. Fellows will spend 2 one-month blocks during their PGY-4 year and 1 one-month block during their PGY-5 year on the Outpatient Hemodialysis Rotation managing hemodialysis patients at ARKC, ADC, and DCI. All outpatient hemodialysis activities are supervised by Nephrology Attending Physicians assigned to patients by shifts. Except for conferences and lectures, the Fellow will be present at the HD unit from approximately 8:30 AM - 5:00 PM, 5 days a week. Fellow responsibilities include, writing and updating hemodialysis orders, evaluation and management of patients’ hemodialysis accesses, dry weights, blood pressures and extracellular fluid balances, hemodialysis prescriptions, nutritional status, osteodystrophy status, anemia status; and will review monthly and other non-routine labs and cultures. The Fellow will also address and triage patient medical complaints. These issues are identified and dealt with through daily rounds. Rounds may be made with or without the Attending present. Fellows on Outpatient HD will also attend the monthly patient-care conferences. These are multidisciplinary conferences attended by the head HD nurse, the on-site Social Worker, and the on-site Dietician. An Attending physician runs the meeting. The purpose of this conference is to review all medical, social and dietary issues that pertain to a patient on chronic hemodialysis.

**Goals and Objectives:**
The Fellows are expected to learn how to determine and how to deliver a patient’s clearance needs, the net ultrafiltration fluid removal and the role of different replacement fluid electrolyte concentrations. They are expected to learn how to write acute hemodialysis orders including decisions related to anticoagulation, potassium, calcium, sodium and bicarbonate dialysate concentrations as well as appropriate fluid removal with ultrafiltration. They are also expected to manage all hemodialysis related problems that develop while a patient receives hemodialysis and other extracorporeal therapies. These include hemodynamic instability, poor access function, dialyzer reactions, air emboli, hemolytic reactions, and hemorrhage. Doing the above integrates the following competencies: "Patient Care", “Systems-based Practice”, “Professionalism”, and "Interpersonal and Communication Skills".

**For 1st year fellows**
- Learn history and physical examination of vascular access
- Learn basic differential diagnosis of vascular access pathology
- Learn details of the acute dialysis prescription and management of the dialysis patient in an acute setting
- Learn communication with referring physicians
- Learn the risks, benefits and indications for the various forms of interventional procedures
- All fellows must present all patients to an attending faculty physician at each visit. The attending will see the patient and either observe the fellow with the patient or repeat critical components of the history and physical. This occurs weekly throughout the academic year.

**For 2nd year fellows**
In addition to skills learned in the first year:
- Refine the history and physical for vascular access
- Refine the differential diagnosis of vascular access problems to be more Complete

All fellows must present all patients to an attending faculty physician at each visit. The attending will see the patient and either observe the fellows with the patient or repeat critical components of the history and physical. This occurs weekly throughout the academic year.
Peritoneal Dialysis

Training in peritoneal dialysis is centered in both the inpatient (AMC) and outpatient (ARKC) setting.

Lines of Responsibility:
Fellows report to Attending Nephrologist during this experience and if the Attending Nephrologist is unavailable, Fellows report to the Key Faculty Nephrologist on-call and ultimately to the Program Director. While on the Clinical service, the Fellow in conjunction with the Attending on the Clinical Service will manage all peritoneal dialysis in the hospital. The issues related to the management of these patients may or may not be similar to those seen in the outpatient setting. This Fellow/Attending team will make daily decisions that are required to manage these patients’ dialysis prescriptions, as well as manage infectious and mechanical complications of the therapy. Fellows will spend one-month blocks each year on the Peritoneal Dialysis Rotation managing peritoneal dialysis patients at ARKC. This is done through formal Peritoneal Dialysis Clinics, in which peritoneal dialysis patients make outpatient visits on a monthly basis. Patients are initially seen and examined by the Fellow who reports to an Attending Physician and the case is discussed. Both the Fellow and the Attending Physician then see the patients and appropriate changes are made in dialysis prescription to affect ultrafiltration or clearance. The patient’s anemia and osteodystrophy management are reviewed and the treatment of a patient’s peritonitis or exit site infection if applicable are reviewed. When new patients start peritoneal dialysis, the Fellow will, in conjunction with the Attending, write orders for the patient that will be tailored to a patient’s medical and lifestyle requirements The Fellows on this service will observe peritoneal dialysis staff based patient training for both CAPD and CCPD, and will become well versed in “connectology”. They will also learn about the diagnosis and outpatient treatment of peritonitis, the outpatient evaluation of peritoneal transport, and peritoneal dialysis adequacy. They will review all labs and cultures.

Goals and Objectives
The Fellow will learn the, or develop an expertise in the following areas of Medical Knowledge for peritoneal dialysis: Although much of this is taught during Peritoneal Dialysis Clinic and in reviewing the Fellows’ notes with the Attending, it is expected that the Fellow make a habit of localizing and assimilating medical evidence from appropriate medical journals as well as other sources of information technology (“Practice-based learning and improvement”).

- Understanding of the principles and practice of peritoneal dialysis, including the establishment of peritoneal access, the principles of dialysis catheters, and how to choose appropriate catheters.
- Understanding of the technology of peritoneal dialysis, including the use of automated cyclers.
- Assessment of peritoneal dialysis efficiency, using peritoneal equilibration testing and the principles of peritoneal biopsy.
- An understanding of how to write a peritoneal dialysis orders.
- An understanding of the complications of peritoneal dialysis, including peritonitis and its treatment, exit site and tunnel infections and their management, hernias, plural effusions, sclerosing encapsulating peritonitis, leaks, and other less common complications and their management.
- An understanding of the special nutritional requirements of patient’s peritoneal dialysis.
- An understanding of the special social services requirements of patients peritoneal dialysis.
- The pharmacology of commonly used medications and their kinetic and dosage alteration with peritoneal dialysis.
• Long-term follow-up of patients undergoing long-term peritoneal dialysis, including their dialysis prescription and modification and assessment of adequacy of dialysis, management of anemia, osteodystrophy, and blood pressure.
• The above skills need to be undertaken with an awareness and responsiveness to the larger context of system health care, as well as an ability to effectively communicate with patients, families and other health professionals. It assumes and requires the Fellow working effectively within the health care system that provides these therapies and determines the appropriate modality of treatment for each patient. Specific patient needs must be taken in consideration including ambulation, socioeconomic factors, a patient’s living situation and family support, and ability to pay for medications that may be medically indicated. In addition there must be effective communication between The Fellow and the ancillary services associated with PD clinic including, Nurses, Dieticians, and Social Workers. The Fellow must show compassion for patients within an ESRD program and respect patients’ autonomy and privacy. Doing the above integrates the following competencies: “Patient Care”, “Systems-based Practice”, “Professionalism”, and “Interpersonal and Communication Skills”.

For 1st year fellows
• Learn history and physical examination of vascular access
• Learn basic differential diagnosis of vascular access pathology
• Learn details of the acute dialysis prescription and management of the dialysis patient in an acute setting
• Learn communication with referring physicians
• Learn the risks, benefits and indications for the various forms of interventional procedures
• All fellows must present all patients to an attending faculty physician at each visit. The attending will see the patient and either observe the fellow with the patient or repeat critical components of the history and physical. This occurs weekly throughout the academic year.

For 2nd year fellows
In addition to skills learned in the first year:
• Refine the history and physical for vascular access
• Refine the differential diagnosis of vascular access problems to be more complete