

	Goals	Instructional Format	Evaluation	Goal Setting Feedback
Inpatient consultation service	To learn to provide accurate and effective consultation based on effective data collection and construction of appropriate differential diagnoses; to learn the principals and practice of renal replacement therapy; to develop leadership and management skills appropriate to running an inpatient dialysis services; to develop skills needed for effective patient-provider and consultant-provider communication in care of patients with renal disease.	Two month inpatient rotations. Fellows assess patients in AM and gather data, adjust dialysis schedules as needed. Rounds with attending nephrologists as scheduled. New consultations received during or after attending rounds are seen as soon as possible; these may be presented to the attending physician after rounds if necessary. Acute dialysis treatments are scheduled throughout the day as required.	Monthly online and oral evaluation of the fellows by the attending nephrologists. Semi-annual evaluation of faculty by fellows. Evaluation of experience by fellows and faculty in rotation with other experiences.	Goals as outlined in program materials and modified by attending each month based on fellow performance.
	Goals	Instructional Format	Evaluation	Goal Setting Feedback
Renal Transplantation Service	To learn the principals and practices currently used in the management of renal transplantation, including: the evaluation of prospective recipients and donors, the choice of recipients for deceased donor kidneys, the use of induction immune suppression and the pharmacologic, immunologic, and clinical basis of the regimen used; the peri-operative management of the renal transplant patient with emphasis on the management of peri-operative diabetes, hypertension, and fluids; the causes of immediate graft non-function; the diagnosis and treatment of hyperacute, acute, and chronic rejection; the differential diagnosis of early transplant dysfunction; the appropriate management of renal failure post-transplant; and the recognition, differential diagnosis and management of infections in the transplant patient.	Two month inpatient rotations. Assessment of inpatients by fellows in AM and as patients arrive to the hospital; rounds with the transplant nephrologists as scheduled. Evaluation and presentation to attending surgeons in the transplant clinic; attendance and participation in the monthly renal transplant patient evaluation meeting; assistance at transplant surgical procedures as permitted by schedule.	Monthly online and oral evaluation of the fellows by the attending transplant nephrologists. Semi-annual evaluation of faculty by fellows. Regular evaluation of experience by fellows and faculty.	Learning objectives set at onset by attending nephrologist. Feedback provided by attending nephrologist and transplant surgeon throughout month.

	Goals	Instructional Format	Evaluation	Goal Setting Feedback
Outpatient Clinic	To learn the principals and practice of outpatient nephrology, including: the provision of effective and efficient outpatient consultation; the diagnosis and management of chronic renal diseases such as diabetic nephropathy, chronic glomerulonephritis and the nephrotic syndrome, ADPKD and other hereditary renal disorders, stone disease, complicated or secondary hypertension; the long term management of renal transplant patients; and the outpatient care of dialysis patients. In addition, the fellow should particularly learn the principals of management applicable to the pre-end stage patient, including the use of diet and medication in the non dialytic management of renal failure.	Bi-weekly clinical experiences. Nephrology clinics on Mondays from 1 – 5 PM, and on Thursdays from 8 AM to noon at the Texas Tech University nephrology clinic.	<p>Monthly online evaluation and additional oral input on an ad hoc basis. Clinic chart reviews may be instituted.</p> <p>Semi-annual evaluation of faculty by fellows. Regular evaluation of the experience by fellows and faculty.</p>	<p>Goals are as stated in this document and in the outline for each year of the fellowship.</p> <p>Feedback is provided in the clinic on case by case bases.</p>
	Goals	Instructional Format	Evaluation	Goal Setting Feedback
Outpatient Dialysis	The goals of this rotations is the mastery of principals and the practice of chronic dialysis therapy including the prescription and delivery of dialysis treatments, the interpretation of treatment adequacy, the care and management of dialysis access, the management of anemia, the management of renal bone disease, the evaluation and management of nutritional issues, the management of hypertension, and the management of intradialytic hypotension.	Six month rotations for second year fellows. The fellow rounds on dialysis shifts and reviews data with and without the attending physician. The fellow takes beeper call Monday through Friday during daytime hours. The fellow rounds once each week with the attending physician on each dialysis shift. Peritoneal dialysis patients are seen in the clinic and at the dialysis center with the peritoneal dialysis nurse. The fellow also attends and contributes to the monthly long and short term care plan meetings and is urged to attend the monthly QI meetings.	<p>Online evaluations are completed at the end of each month. Oral evaluations may be given at any time during the month by the attending physician.</p> <p>Semi-annual evaluation of faculty by fellows. Regular evaluation of the experience by fellows and faculty.</p>	Goals are as set forth in this document and in the formal statements regarding the second year curriculum. The attending nephrologists may set specific goals for each month. Feedback is supplied regularly during dialysis rounds.

	Goals	Instructional Format	Evaluation	Goal Setting Feedback
Peritoneal Dialysis	To learn the principals and practice of chronic peritoneal dialysis treatment, emphasizing the interpretation of tests of treatment adequacy, the management of peritoneal and tunnel infections, the management of catheter malfunction, and the management of anemia, hypertension, bone disease and nutrition in the peritoneal dialysis patient.	One to two month rotation in the Red Bud Dialysis Center, during which time the fellow will devote his/her time to the care of the patients in the peritoneal dialysis clinic. The schedule is set by the dialysis unit staff.	<p>Rotation written evaluations will be made by Dr. C.J. Wheeler. Oral evaluation may be provided during this month.</p> <p>Semi-annual evaluation of faculty by fellows. Regular evaluation of the experience by fellows and faculty</p>	Goals are stated in this document and in the curriculum for the second fellowship year. Feedback from the dialysis unit staff and physicians.
	Goals	Instructional Format	Evaluation	Goal Setting Feedback
Renal Stone Clinic	To develop experience in the care of patients with renal stone disease and to broaden the understanding of the pathophysiology of renal stone disease. The goal of the rotation is to make the fellow more comfortable with the evaluation and care of the renal stone patient, to familiarize the fellow with urological techniques of stone removal and lithotripsy, and to allow for organized longitudinal follow up of intervention in stone disease.	Bimonthly clinic in the Department of Urology. Fellows see and evaluate patients with stone disease and present cases to Urology attendings in the clinic.	<p>Semi-annual online evaluations are provided. Oral evaluations may be given at any time during the month by the attending physician.</p> <p>Semi-annual evaluation of faculty by fellows. Regular evaluation of the experience by fellows and faculty.</p>	The general goals are set forth in the overall curriculum. The intent is that the fellows become competent in the evaluation of renal stones and are able to outline treatment and its limitations. Feedback is given in conference.

	Goals	Instructional Format	Evaluation	Goal Setting Feedback
Biopsy Conference	To learn the histology and pathology of the kidney by reviewing the results of biopsies performed by the fellows or submitted to the pathology department by other physicians.	Monthly conference. Biopsy findings are presented and slides are interpreted by conference participants. Clinical data is presented by the fellows and treatment is discussed by staff and fellows. The conference takes place the fourth Thursday of each month.	Monthly online evaluations are provided.	The goals are set forth in the overall curriculum. The intent is that the fellows competently interpret renal biopsies and are able to outline treatment. Feedback is given in conference.
	Goals	Instructional Format	Evaluation	Goal Setting Feedback
Research Conference	The fellows will learn the principals of research, including its ethics, its designs, the analysis of data, and art of presentation of results.	Monthly conference. Research is performed by the fellow throughout the fellowship, especially in the second year. Projects are suggested by the fellow or faculty, and the schedule for its performance is arranged individually. Conference is held Thursdays at 4PM.	Research is evaluated by the faculty member primarily involved. Presentations are reviewed in written form on a monthly basis. Final product is reviewed by the journal or conference peer review system.	Goals for the research project are set by the faculty involved. The overall goal is the generation of data worthy of publication in a peer reviewed journal. Feedback is individualized.
	Goals	Instructional Format	Evaluation	Goal Setting Feedback
Journal Club	To learn to critically analyze the renal literature, the appropriate use of statistical analysis, the ethics of research, and to expand the fellow's knowledge base by accessing new developments in nephrology.	Bimonthly conference. Fellows present and critique papers from current peer reviewed journal each Wednesday at 4 PM. Faculty, fellows and residents take part in the discussion.	Monthly online evaluations are provided. Individual presentations may be evaluated at the time of presentation.	Goals as stated. Papers may be specifically selected for fellows based on a fellow's need to expand in a specific area. Feedback from audience.

	Goals	Instructional Format	Evaluation	Goal Setting Feedback
Didactic Conference	In depth review of renal anatomy, physiology, pathophysiology, histopathology, epidemiology, and treatment.	Weekly lecture conference. Formal presentations by faculty each Tuesday at 8 AM from September through June. Readings are assigned. The total cycle of lectures covers two years. One year is predominantly basic science and pathophysiologically based. The second year is more devoted to the pathology of renal disease and a number of clinical topics.	There is no scheduled fellow evaluation for this activity. A more formal evaluation of the fellows' learning and quality of the course material may be made after an "in service" written exam becomes available.	The course outline indicates the topics covered, this varies with the semester. The overall two year cycles includes renal anatomy, physiology, histopathology, and therapeutics. The material should be incorporated by fellow into other activities as "knowledge base" Feedback is provided as this base is utilized in clinical rotations and in other conferences
	Goals	Instructional Format	Evaluation	Goal Setting Feedback
Clinical Conferences	Clinically based review of clinical cases and problems by fellow. Each conference presentation is based on a clinical encounter or problem specific to the service on which the fellow is rotating. The services/rotations specifically represented are: Transplant, Inpatient Consultation, Outpatient Dialysis, Peritoneal Dialysis, and Clinic. Transplant and Consultation problems are generally expected to be related to specific patients. Dialysis related conferences may address general problems the fellow is encountering (i.e. anemia, hypertension, phosphate control, nutrition, catheter infection, clearance, etc. , though in these cases a review of center data should be presented).	Case presentation or group data presentation and discussion with review of literature especially outcomes research, randomized controlled studies, and clinical reviews. KDOQI recommendations and clinical guidelines from other groups should be considered if such applicable standards exist.	Evaluation is presented as immediate feedback to presentation and answers to questions. Online evaluation of performance. The fellows' performance here is used to judge their ability to utilize the literature, integrate current literature and guidelines into clinical practice, and generate new hypotheses.	General goal is to cover clinically applicable aspects of physiology and pathophysiology and to outline the established and defacto algorithms used by practicing nephrologists in analysis of clinical problems. Feedback is immediate.

Nephrology Fellowship Program

Learning Objectives

Inpatient Consult Nephrology Services

	Symptoms	Diseases/Conditions	Risk Factors	Systems of Care	Psycho-social	Ethics
Knowledge	List symptoms of: Hematuria, Proteinuria, Nephritis, RPGN, Nephrosis, ARF and CRF, list symptoms of uremia and their pathogenesis	Describe epidemiology, pathophysiology, and treatment of conditions listed in curriculum documents and Tables A and B below.	List risks for development of ARF in and out of hospital; lists risk factors for chronic renal disorders, describes impact of renal failure on survival; recognize impact of renal failure on drug metabolism. List risks incurred in uremia, recognized increased cardiovascular risks in CRF and ESRD	List the acute and non acute indications for dialysis and contraindications. List indications and contraindications for renal biopsy.	Recognize and describe impact of chronic dialysis on long term QOL; recognize validity of choosing not to accept dialysis	Describe impact of ESRD on society. Appropriately counsel ESRD patients on end-of-life decisions. Provide accurate informed consent. Describe impact of renal failure on prognosis.
History Taking	Demonstrate the ability to obtain history relevant to renal disorders and to uremia.	List historical data sought in the various renal disorders. Accurately elicit history of medical conditions that may impact response to or effectiveness of dialysis.	Demonstrate ability to identify risk factors during review of records and laboratory data. Demonstrate ability to elicit historical data from chart for issues affecting response to dialysis , survival and prognosis.		Obtain psychiatric history to assess patient competence. Recognize and describe importance of family and social support in adjustment to dialysis.	Obtain social history that allows culturally sensitive discussion of ethical issues. Recognize situations in which dialysis may be futile therapy.
Physical Exam	List physical findings sought when evaluating specific symptoms elicited by history taking.	Accurately detect signs of: uremia, volume overload; athero-embolic disease, relevant systemic disorders. Assess dialysis access.	Accurately demonstrate physical findings that confirm or deny presence of underlying risk factors for renal diseases.	Demonstrate findings that indicate acute need for dialysis.		
Procedures	Perform complete urinalysis to confirm presence of listed symptoms.	Insert dialysis catheters, order and manage HD, CVVHD and PD. Perform renal biopsies; manage complications of dialysis and biopsies. See Table C.	List patient risk factors that alter risk benefit ratio for diagnostic procedures.	Demonstrate ability to analyze effectiveness of dialysis.	Demonstrate ability to deal with problems of patient behavior on dialysis.	Recognize the limitations of therapy and identify those instances when intervention may be therapeutically futile.
Attitudes & Values		Demonstrates self motivated independent disease specific learning	Acknowledges importance of prevention, describes roles of hypertension, obesity, salt intake, phosphate intake in development of renal disease.	Demonstrates awareness of team nature of dialysis treatment. Works well with team.	Demonstrates openness to patient attitudes and concerns about renal replacement therapy.	Recognizes and accept patient reasons to refuse or withdraw from treatment.
Behaviors	Makes accurate diagnoses of renal disorders. Recognizes symptoms of uremia, electrolyte disorders, and volume overload and appropriately schedules dialysis.	Demonstrates ability to care for inpatients with renal diseases. Participate in clinical conference. Demonstrate ability to place acute catheters.	Demonstrates ability to teach patients their responsibilities with regard to reducing behaviors, i.e., smoking cessation, medication and diet non-compliance, weight loss, control of fluid intake.	Demonstrates ability to work effectively with other disciplines. Teaches residents and students.	Demonstrates ability to interact sensitively and compassionately with patients, family other physicians and other staff members.	Demonstrates active investigation of ethical questions and willingness to enter into discussions of ethics. Describes methods to deal with non-compliant dialysis patients.

Table A Knowledge of Disease/Condition

Be able to describe:

1. Techniques for evaluation of renal structure and function
2. The approach to the diagnosis and management of acute renal failure in hospital patients
3. The radiographic, sonographic, and nuclear medicine findings in various forms of renal failure.
4. The metabolic consequences of acute renal failure
5. The diagnosis and management of chronic renal disease in the hospitalized patient.
6. The management of hospitalized patients with acute and chronic renal failure.
7. The diagnosis and management of patients with acute glomerulonephritis.
8. The diagnosis and management of patients with renovascular disease and renal vasculitis.
9. The diagnosis and management of patients with acute and chronic interstitial nephritis.
10. The diagnosis and management of disorders of salt and water metabolism.
11. The diagnosis and management of clinical disorders of calcium, potassium, magnesium and phosphorus.
12. The diagnosis and management of hospitalized patient with diuretic use.
13. The diagnosis and management of clinical acid base disorders.
14. The approach to, diagnosis of, and techniques for managing disorders of the lower urinary tract.
15. The choice and use of the various renal replacement techniques and their indications.
16. The use of dietary modification in management and prevention of renal failure.
17. The diagnosis and management of accelerated malignant hypertension in hospitalized patients.
18. The diagnosis and management of hospitalized patients with acute pyelonephritis, and renal abscess with special attention to infections in patients with polycystic kidney disease.
19. The pathogenesis of uremia.
20. Types, advantages and disadvantages of maintenance hemodialysis, CRRT, and peritoneal dialysis.
21. Principals of hemodialysis including machinery, dialysate, anticoagulation, clearance and complications.
22. Principals of CRRT including machinery, dialysate, anticoagulation, clearance and complications.
23. Principals of peritoneal dialysis including solute and water flux, membrane properties, and dialysate composition.
24. Principals of dialysis adequacy in all forms of dialysis and use in determining dialysis prescriptions.
25. Role of temporary and tunneled catheters for HD and CRRT, access for PD; radiology of access placement and evaluation.
26. The metabolic consequences of ARF and the management of ARF with dialysis, effects and dosing of medications in ARF.
27. Fluid management in ARF patients; use of dialysis to manage fluids.
28. The diagnosis and management of anemia and osteodystrophy in ARF patients.
29. The role of nutritional support and dietary management in ARF patients; the impact of dialysis on nutritional requirements.
30. Ethical issues of dialysis; including withholding and withdrawing therapy in the hospital setting; role of social work and ethics committees.
31. Basic principals of financing and personnel management in acute dialysis setting.

Table B Knowledge of Disease/Condition

Be able to list:

1. The causes of secondary hypertension.
2. All common medications requiring dose modification in renal insufficiency and renal failure.
3. Indications for initiation of dialysis or CRRT in acute renal failure.
4. The indications for renal biopsy in the hospitalized patient with renal disease.
5. The indications for hemodialysis, hemofiltration, and hemoperfusion in ingestion of specific toxins.
6. The components used in dialysis membranes and their relative biocompatibility, and solute and water transport characteristics.
7. Major drug interactions and dosing adjustments in ARF.

Perform:

1. Placement of catheters for acute hemodialysis.
2. Initial assessment and triage of patients with acute renal failure and chronic dialysis patients with acute problems.
3. Dialysis decision making and management in acute renal failure.
4. Management of CRRT methods as indicated.
5. Accurate urinalysis.
6. Instruction of residents in the care of patients with acute and chronic renal failure.
7. Extrapolation of K/DOQI guidelines to the setting of ARF in the hospital.
8. Calculation of KT/V or URR for hemodialysis, peritoneal dialysis, and CRRT in the hospital setting.

Table C Procedures for Disease/Condition

Be able to perform:

1. Placement of temporary dialysis catheters.
2. Renal biopsy of native kidneys.
3. Renal biopsy of renal transplants.
4. Evaluation and management of patients post procedure or complication.
5. Management of dialysis complications.
6. Hemodialysis, peritoneal dialysis, and CRRT in the acute hospital setting.
7. Acute venous catheterization for purposes of hemodialysis or CRRT.
8. Evaluation and management of complications or ARF, HD, PD, and CRRT.

Nephrology Fellowship Program

Learning Objectives

Transplant Service

	Symptoms	Diseases/Conditions	Risk Factors	Systems of Care	Psycho-social	Ethics
Knowledge	List causes of decreased kidney function, oliguria, anuria, hematuria and fever in the transplant patient.	See Tables A and B on next page and curriculum documents.	List risk factors for acute rejection, chronic rejection, chronic transplant nephropathy; recurrent disease , recognize major drug interactions and impact of renal failure on drug dosing.	List the indications for dialysis pre and post kidney transplant. List the contraindications for renal transplant.	Describe the impact of successful renal transplant, failure of renal transplant, and rejection on patient and family.	Describe the social impact of transplant, the ethics of LRKT, LURKT, non-beating heart, and altruistic donation.
History Taking	Elicit symptoms of acute and chronic rejection, infections, lymphocele, hematoma, and ureterocolle in the transplant patient.	List historical data sought in pre-transplant patient assessment. Accurately elicit history of medical conditions that may impact transplantation.	Uncover relevant history of diseases and conditions that may adversely impact on transplant outcome.		Evaluate issues of patient compliance, family and social support, and psychological disorders that may adversely impact transplant outcome.	Describe the risks and benefits of transplantation for the individual patient and accurately provide for truly informed consent.
Physical Exam	List physical findings sought when evaluating specific symptoms elicited by history taking.	Accurately detect signs of uremia, volume overload, volume depletion, infections associated with transplant, PTLD, and medications side effects.	Accurately demonstrate physical findings that confirm or deny presence of underlying risk factors for poor transplant outcome.	Demonstrate findings that indicate acute need for dialysis. Demonstrates finding indicating need for further treatment.		
Procedures	Perform complete urinalysis	Manage complications of renal transplant surgery. Perform tasks outlined in Table C below.	List surgical considerations that increase chances for post transplant renovascular problems, ureteral stenosis and disruption, obstructive uropathy, and lymphocele	Analyze data and detects signs of acute rejection, chronic rejection, and chronic nephropathy.	Demonstrate ability to deal with issues of patient non-compliance. Recognizes psychological impact of steroids.	Recognize instances when renal transplantation is contra-indicated.
Attitudes & Values		Demonstrates self motivated independent disease specific learning	Acknowledges importance of prevention, describes roles of hypertension, obesity, medication compliance, smoking, control of cholesterol, and diet.	Demonstrates awareness of team nature of renal transplantation. Works with team.	Demonstrates openness to patient attitudes and concerns about renal transplantation.	Recognizes and accept patient reasons to refuse transplantation option.
Behaviors	Accurately diagnoses post transplant complications. Recognizes rejection, electrolyte disorders, and volume overload and appropriately responds.	Demonstrates ability to care for inpatients with renal transplant. Participate in clinical conference. Participates in monthly transplant conference.	Demonstrates ability to teach patients their responsibilities with regard to reducing behaviors, i.e., smoking cessation, medication and diet non-compliance, weight loss, control of fluid intake.	Demonstrates ability to work effectively with other disciplines. Teaches residents and students.	Demonstrates ability to interact sensitively and compassionately with patients, family other physicians and other staff members.	Demonstrates active investigation of ethical questions and willingness to enter into discussions of ethics. Demonstrates ability to effectively intervene with non-compliant patients.

Table A Knowledge of Disease/Condition

Be able to describe

1. Normal immune response to infection or other insult.
2. The immunologic basis of hyperacute, acute and chronic allograft rejection.
3. The immunologic basis for methods of immunosuppression.
4. Immunogenetics and tissue typing, crossmatching and surveillance for panel reactive antibodies.
5. The system of organ sharing and allocation.
6. Surgical procedures for cadaveric and living kidney transplantation.
7. The diagnosis and management of acute renal failure in hospitalized transplant patients.
8. Radioographic, ultrasound, and nuclear medicine findings in various causes of acute allograft rejection.
9. The metabolic consequences of ARF in transplant patients.
10. The major side effects, metabolism, and complications caused by immunosuppressive medications.
11. The diagnosis and management of chronic renal failure in the hospitalized transplant patient.
12. The fluid management of hospitalized transplant patient with acute or chronic renal failure.
13. The diagnosis and management of transplant patients with recurrent or de novo glomerulonephritis.
14. The diagnosis and management of hemolytic uremic syndrome and other microangiopathies in the hospitalized transplant patient.
15. The diagnosis and management of transplant patients with PTLD, anemia, polycythemia, and other hematological disorders.
16. The diagnosis and management of disorders of the lower urinary tract in renal transplant patients.
17. Dietary modifications appropriate to the care of renal transplant patients.
18. The diagnosis and management of accelerated or malignant hypertension in transplant patients.
19. The diagnosis and management of pyelonephritis, renal abscess, and perirenal abscess in renal transplant patients.
20. Ethical issues in transplantation.
21. Economic issues for recipients, donors, and providers.

Table B Knowledge of Disease/Condition

Be able to list:

1. The common causes for acute renal failure in renal transplant patients.
2. The indications for biopsy of the renal allograft.
3. The histopathological criteria for the diagnosis of acute and chronic rejection.
4. Major drug interactions with immunosuppressive medications.

Table C Procedures for Disease/Condition

Be able to perform:

1. Acute venous catheterization to place acute dialysis catheters.
2. Renal allograft biopsy.
3. Evaluation and management of complications in renal transplant patients.
4. Management of the complications of dialysis in renal transplant patients.

Nephrology Fellowship Program

Learning Objectives

Outpatient Dialysis Services

	Symptoms	Diseases/Conditions	Risk Factors	Systems of Care	Psycho-social	Ethics
Knowledge	List uremic symptoms and their pathogenesis. List symptoms of complications seen in ESRD, HD and PD>	See Tables A and B on next page and curriculum documents.	Describe impact of ESRD and dialysis on vascular disease, stroke, infection, and bone disease. List risks of medications used in dialysis patients on blood pressure, GI symptoms, bone disease, and anemia.	List indications for chronic renal replacement. List K/DOQI guidelines for chronic dialysis care.	Describe impact of dialysis on patient and family QOL.	Describe the impact of dialysis on health care and society. Describe the issues involved in withdrawal from therapy and end-of-life decisions.
History Taking	Demonstrate ability to elicit symptoms of uremia, volume status, bone disease, anemia, CAD, and medication side effects.	Demonstrate ability to obtain history of medical conditions that require concurrent care and impact survival or the ability to provide effective dialysis.	Demonstrate ability to review records to determine presence of all conditions impacting the care of the individual dialysis patient.	Demonstrate ability to interact with primary care physicians to ensure appropriate overall management of the dialysis patient.	Describe common compliance problems and describe appropriate interventions. Describe attributes needed to effectively provide home self care.	Accurately describe risks and benefits of dialysis and access procedures.
Physical Exam	List physical findings sought when evaluating specific symptoms elicited by history taking.	Accurately detect signs of: uremia, volume overload, relevant systemic disorders. Assess dialysis access. Detect access infections, steal, peritonitis and tunnel infections.	Accurately demonstrate physical findings that confirm or deny presence of underlying risk factors for renal diseases.	Demonstrate findings that indicate need for dialysis, changes in treatment protocol.		
Procedures	Perform assessment of dialysis therapy using on-line real time data. Adjusts therapy appropriately.	Prescribe dialysis appropriately, monitors outcomes and adjusts RX, evaluates and manages complications of ESRD and dialysis per K/DOQI guidelines. See Table C on next page.	List risks factors that alter risk benefit ratios and change long term outcomes for dialysis or transplantation.	Analyze outcome data including KT/V, PET tests, anemia data, nutritional data, and bone disease management data. Adjusts RX.	Advise patients regarding issues of compliance to diet, medication, and treatment attendance.	Participate in discussions concerning patient withdrawal, dismissal, and referral for transplantation.
Attitudes & Values		Demonstrates self motivated independent disease specific learning	Acknowledges importance of prevention, describes roles of hypertension, obesity, medication compliance, smoking, control of cholesterol, and diet.	Demonstrates awareness of team nature of renal transplantation. Works with team.	Demonstrates openness to patient attitudes and concerns about renal transplantation.	Recognizes and accept patient reasons to refuse transplantation option.
Behaviors	Recognizes electrolyte disorders, bone disease, anemia and volume disorders.	Demonstrates ability to care for inpatients with renal transplant. Participate in clinical conference. Participates in monthly transplant conference.	Demonstrates ability to care for chronic dialysis patients, attends monthly care plan and QI meetings.	Demonstrates ability to work effectively with other disciplines.	Demonstrates ability to interact sensitively and compassionately with patients, family other physicians and other staff members.	Demonstrates ability to effectively intervene with non-compliant patients.

Table A Knowledge of Disease/Condition

Be able to describe

1. The pathogenesis of uremia.
2. Types, advantages and disadvantages of maintenance hemodialysis, and peritoneal dialysis.
3. Principals of hemodialysis including hemodynamics, solute and water flux, dialysis membrane properties, biocompatibility, and dialysate composition.
4. Water treatment and dialysate delivery systems for hemodialysis.
5. Techniques, advantages, and disadvantages of dialyzer reuse.
6. Principals of peritoneal dialysis including solute and water flux, membrane properties, and dialysate composition.
7. Connection and cycling systems in peritoneal dialysis.
8. Principals of dialysis adequacy in all forms of dialysis and use in determining dialysis prescriptions.
9. Surgical techniques for creation and management including native fistulae, synthetic grafts, shunts, vein transpositions, and peritoneal dialysis catheter placement.
10. The radiology of access placement and evaluation of accesses.
11. The metabolic consequences of ESRD
12. The use and dosing of medications in ESRD,
13. The major complications of ESRD and hemodialysis including access complications.
14. Fluid management in ESRD patients.
15. The diagnosis and management of anemia in ESRD patients.
16. The diagnosis and management of osteodystrophy in ESRD patients.
17. The diagnosis and management of cardiovascular disease and hyperlipidemia in ESRD patients.
18. The approach to and management of disorders of the upper urinary tract including acquired cystic disease in ESRD patients.
19. The approach to and management of disorders of the lower urinary tract including cystitis in ESRD patients.
20. The role of nutritional support and dietary management in ESRD patients.
21. Ethical issues of dialysis and dialysis withdrawal.
22. Role of Medicare dialysis networks, USRDS and voluntary societies in administration and financing of ESRD care.

Table B Knowledge of Disease/Condition

Be able to list or access:

1. The components of hemodialysis membranes and their relative biocompatibility, and solute and water flux characteristics.
2. Major drug interactions and dosing adjustments necessary in ESRD , HD, and PD.
3. National Kidney Foundation K/DOQI guidelines for adequacy of dialysis and standards of care for chronic dialysis patients.

Be able to calculate:

1. KT/V , URR , and other clearance values for both hemodialysis and peritoneal dialysis patients to determine treatment adequacy.

Table C Procedures for Disease/Condition

Be able to perform:

1. Dialysis prescription and supervision for maintenance hemodialysis and peritoneal dialysis patients.
2. Evaluation and management of complications in ESRD patients.
3. Management of complications of hemodialysis and peritoneal dialysis.

Nephrology Fellowship Program

Learning Objectives

Outpatient Nephrology Clinics

	Symptoms	Diseases/Conditions	Risk Factors	Systems of Care	Psycho-social	Ethics
Knowledge	List symptoms of: Hematuria, Proteinuria, Nephritis, RPGN, Nephrosis, ARF and CRF, list symptoms of uremia and their pathogenesis. List symptoms of secondary HTN.	Describe epidemiology, pathophysiology, and treatment of conditions listed in curriculum documents and in Tables A and B on next page.	List risk factors for development of proteinuria, hematuria, and chronic renal disease, risk factors for hypertension, risks for renal failure associated with medication use. Describe modification of medication dosage in renal diseases.	Outline and describe the K/DOQI guidelines for chronic renal diseases. List indications for initiation of treatment in acute and chronic renal disease.	Recognize impact of renal disease and renal replacement on QOL decisions. Recognize factors that may lead patient to decline or withdraw from treatment,, whether for ESRD or other disorders.	Describe the impact of chronic renal disease on health care and society. Outline current approaches to counseling patients on end-of life issues in renal disease and ESRD.
History Taking	Demonstrate the ability to obtain history relevant to renal disorders and HTN and to uremia.	List historical data sought in the various renal disorders. Accurately elicit history of medical conditions that may impact response to or effectiveness of treatment.	Demonstrate ability to accurately review records for history relevant to chronic and acute renal disease and hypertension.		Obtain psychiatric history to assess patient competence. Recognize and describe importance of family and social support in adjustment to chronic renal disease.	Accurately describe risks and benefits of treatments offered for renal disease. Accurately describe risks and benefits for renal replacement therapies.
Physical Exam	List physical findings sought when evaluating specific symptoms and systemic disorders elicited by history taking.	Accurately detect signs of: uremia, volume overload; athrero-embolic disease, and relevant systemic disorders. Assess dialysis access.	Accurately demonstrate physical findings that confirm or deny presence of underlying risk factors for renal diseases, cardiovascular diseases, and underlying or complicating systemic diseases..	Demonstrate findings that indicate acute need for dialysis.		
Procedures	Perform accurate urinalysis.	Perform tasks outlined in Table C on next page.	List patient risk factors that alter risk benefit ratio for diagnostic procedures.	Demonstrate ability to analyze effectiveness of treatments.	Demonstrate ability to deal with problems of patient behavior s.	Recognize the limitations of therapy and identify those instances when intervention may be futile or unneeded.
Attitudes & Values		Demonstrates self motivated independent disease specific learning	Acknowledges importance of prevention, describes roles of hypertension, obesity, salt intake, phosphate intake in development of renal disease.	Works well with nursing staff, allied personnel, dialysis and transplant teams.	Demonstrates openness to patient attitudes and concerns about renal replacement therapy.	Recognizes and accept patient reasons to refuse or withdraw from treatment.
Behaviors	Accurately diagnoses renal disorders, uremia, electrolyte disorders, and volume overload. Treats appropriately.	Demonstrates ability to care for inpatients with renal diseases. Participate in clinical conference	Demonstrates ability to teach patients their responsibilities with regard to reducing behaviors, i.e., smoking cessation, medication and diet non-compliance, weight loss, control of fluid intake.	Demonstrates ability to work effectively with other disciplines. Teaches residents and students.	Demonstrates ability to interact sensitively and compassionately with patients, family other physicians and other staff members.	Demonstrates active investigation of ethical questions and willingness to enter into discussions of ethics.

Table A Knowledge of Disease/Condition

Be able to describe:

1. Techniques for evaluation of renal structure and function
2. The approach to the diagnosis and management of proteinuria, hematuria, and chronic kidney disease in outpatients with special attention to treatments to delay or prevent progression to end stage kidney disease.
3. The radiographic, sonographic, and nuclear medicine findings in various forms of chronic and acute renal disease in the outpatient setting..
4. The metabolic consequences of chronic renal diseases.
5. Fluid management in outpatients with chronic renal disease.
6. The management of hypertension in the outpatient with chronic renal diseases.
7. The diagnosis and management of patients with acute glomerulonephritis.
8. The diagnosis and management of patients with renovascular disease and renal vasculitis.
9. The diagnosis and management of patients with acute and chronic interstitial nephritis.
10. The diagnosis and management of disorders of salt and water metabolism.
11. The diagnosis and management of clinical disorders of calcium, potassium, magnesium and phosphorus.
12. The diagnosis and management of outpatients with diuretic use.
13. The diagnosis and management of clinical acid base disorders.
14. The approach to, diagnosis of, and techniques for managing disorders of the lower urinary tract.
15. The choice and use of the various renal replacement techniques and their indications.
16. The use of dietary modification in management in prevention and management of chronic renal diseases..
17. The diagnosis and management of accelerate malignant hypertension in hospitalized patients.
18. The diagnosis and management of patients with acute pyelonephritis, and renal abscess with special attention to infections in patients with renal failure and polycystic kidney disease.
19. The diagnosis and management of outpatients with genetic renal diseases with special attention to ADPKD.

Table B Knowledge of Disease/Condition

Be able to list:

1. The causes of secondary hypertension.
2. All common medications requiring dose adjustment in patients with glomerulonephritis, vasculitis, proteinuria, hematuria, and chronic kidney diseases.
3. Indications for initiations of dialysis and transplantation in chronic and acute renal failure.
4. Indications for initiation of steroids and/or immunosuppressive drugs in patients with glomerulonephritis and vasculitis..
5. Indications for renal biopsy in the diagnosis of acute, subacute, and chronic renal disorders.

Table C Procedures for Disease/Condition

Be able to perform:

1. Native kidney biopsy for diagnosis and management of acute and chronic kidney diseases.
2. Complete urinalysis.
3. Instruction of residents and students in the evaluation and management of proteinuria, hematuria, hypertension, and chronic renal diseases.
4. Evaluation and management of patients with complications post renal biopsy.
5. Counseling of patients receiving biopsy results.

Nephrology Fellowship Year One -- Description

	UMC Consultation Service	Renal Transplantation Service	Nephrology Clinic
Educational Experience	Inpatient renal consultation services that also serve as primary service for established transplant patient. Fellow performs renal consultations, directs all inpatient dialysis and continuous renal replacement therapy (CRRT), and oversees the care of all renal transplant patients under the guidance of faculty nephrologists.	Inpatient service and outpatient transplant clinic (Urology). The fellow directs care of new and established renal transplant patients under direction of Nephrology faculty and transplant surgeon. The fellow is encouraged to observe and may assist at transplant surgery.	Outpatient consultative and continuity clinic. Fellow performs new consultation evaluations and directs care of established patients with glomerular and tubular disease, chronic kidney disease, and ESRD.
Teaching Methods	Teaching and management rounds are performed on a daily basis. Consultations are reviewed by responsible faculty member. Faculty is available for immediate support when needed.	Daily rounds on transplant service with attending nephrologist. Instruction by transplant surgeons in clinic. Informal teaching sessions conducted as time permits. Review of findings and discussion of decision making in clinic. Instruction by surgical staff as fellow observes surgical procedures.	Review of patient history, physical findings, and laboratory data. Discussion of diagnosis and decision making process. Review of recommendations or therapeutic decisions. Ad hoc discussion of disease entities, therapeutic options, and overall plan of care.

	UMC Consultation Service	Renal Transplantation Service	Nephrology Clinic
Mix of Diseases	<p>Patients include ESRD patients admitted from a faculty practice of over 170 chronic dialysis patients and 250 transplant patients, new consultations with acute and chronic renal diseases from the hospital population. There are significant numbers of intensive care, burn, and trauma patients with acute renal failure, and extensive exposure to diabetic nephropathy. The overall patient population includes significant numbers of patients with various primary and secondary kidney diseases due to the tertiary care nature of the hospital.</p>	<p>New and established renal transplant patients, a majority of whom have diabetes as the cause of renal failure. Any patient transplanted in Lubbock may be transferred to UMC for care of any significant medical or surgical issues at the request of the primary care nephrologists. Other transplant patients are also accepted for transfer upon request. All kidney transplant patients in UMC are placed on this service except for those patients admitted to transplant surgery or Urology who are followed as consults.</p>	<p>Patients with chronic kidney disease of various stages, ESRD patients from faculty practice, patients with glomerular and tubular disorders, patients with complicated hypertension issues, and new referral patients. New and established renal transplant patients from UMC program. 50 to 60 % DM nephropathy. Majority with hypertension. 5 – 10 % polycystic kidney disease, 15 – 20 % glomerulonephritis</p>
Patient Characteristics	<p>A broad spectrum of renal disorders is seen with increased experience with trauma and burn patients due to hospital activity in this area. There is a high incidence of diabetes, hypertension, and CVD. The hospital serves as both a primary and tertiary care center with a complex patient population. Mean age 55 – 60, 60% male, > 50% minority status Ethnically more than 40% Mexican American, 10- 15% African American.</p>	<p>Mean age 55 – 60, 60% male, ~ 50% minority status, > 50% diabetic. The catchment area for transplantation includes the Texas panhandle, eastern New Mexico, north Texas, and the Abilene area.</p>	<p>Ethnically more than 40% Mexican American, 10- 15% African American. 60% diabetic. Age range from 14 to 80's with many patients over 70. Gender ratio near 1:1.</p>

	UMC Consultation Service	Renal Transplantation Service	Nephrology Clinic
Types of Clinical Encounters	Inpatient consultation rounds at bedside and in inpatient dialysis units. Intensive care unit rounds in multiple units. Emergency department consultations.	Inpatient ward rounds, transplant clinic visits, attendance at surgical procedures	New patient referral and consultation, established patient return clinic visits.
Procedures	Acute and chronic hemodialysis, continuous renal replacement therapies, peritoneal dialysis. Insertion of acute dialysis catheters. Biopsy of native kidneys. Performance of consultation.	Insertion of dialysis catheters. Procedures needed for diagnosis of infection including lumbar puncture and paracentesis, Observation of transplant surgery; possible assistance at transplant surgery. Biopsy of transplant kidneys.	Performance of consultations. Urinalysis.
Services	Nephrology consult service at UMC.	Transplant service, UMC. Transplant clinic, Urology department, Texas Tech University Health Sciences Center.	Nephrology division clinics, Texas Tech University Health Sciences Center.
Reading Lists	Attached.	Attached.	Attached.

	UMC and CMC Consultation Service	Renal Transplantation Service	Nephrology Clinic
Method of Evaluation	Online and oral evaluation of the fellows by the attending nephrologists.	Online and oral evaluation of the fellows by the attending nephrologists and transplant surgeon.	Online and oral evaluation of the fellows by the attending nephrologists. Planned semi-annual audit of clinic charts to determine fellow adherence to K/DOQI care guidelines.

Nephrology Fellowship Year Two -- Description

	University Outpatient Dialysis	Peritoneal Dialysis	Nephrology Clinic
Educational Experience	<p>Fellows supervise hemodialysis patient care at the Dialysis Center of Lubbock, an outpatient dialysis center owned and managed by Fresenius Dialysis Services and staffed by TTU nephrology faculty. More than 90% of the patients are seen by the fellow and faculty, (10% of patients are followed by private nephrologists associated with the program). There are six dialysis shifts; the fellow rounds with the faculty on about 60 TTS or MWF patients weekly. All aspects of dialysis and general care are discussed, and treatment is evaluated and adjusted as needed. The fellow attends short and long term care conferences, and may attend QI meetings. The rotations last six months during which the fellow has an opportunity to view the chronic aspects of ESRD patient care. After six months with the patients and faculty on one schedule, the fellow switches to the other set of patients.</p>	<p>Rotation at Redbud Dialysis the fellows spend two months specifically seeing peritoneal dialysis patients in concert with experienced nursing staff and faculty. This is one of the largest peritoneal clinics in Texas.</p>	<p>Outpatient consultative and continuity clinic. Fellow performs new consultation evaluations and directs care of patients with glomerular and tubular disease, chronic kidney disease, and ESRD care.</p>

	University Outpatient Dialysis	Peritoneal Dialysis	Nephrology Clinic
Teaching Methods	Fellows round independently as needed and weekly with faculty as scheduled on each of the hemodialysis shifts. Patient care is reviewed and decisions are discussed.	The fellows see patients with the nursing staff, and review labs and findings. Review labs and problems with attending nephrologist.	Review of patient history, physical findings, and laboratory data. Discussion of diagnosis and decision making process. Review of recommendations or therapeutic decisions. Ad hoc discussion of disease entities, therapeutic options, and overall plan of care.
Mix of Diseases	All patients have end stage renal failure. The most common diagnoses causing renal failure are diabetes and hypertension, followed by glomerular diseases, renovascular disease, and cystic/inherited renal disease.	The Redbud unit has more than 60 peritoneal dialysis patients. The most common diagnoses causing renal failure are diabetes and hypertension, followed by glomerular diseases, renovascular disease, and cystic/inherited renal disease.	Patients with chronic kidney disease of various stages, ESRD patients from faculty practice, patients with glomerular and tubular disorders, patients with complicated hypertension issues, and new referral patients. New and established renal transplant patients from UMC program. 50 to 60 % DM nephropathy. Majority with hypertension. 5 – 10 % polycystic kidney disease, 15 – 20 % glomerulonephritis

	University Outpatient Dialysis	Peritoneal Dialysis	Nephrology Clinic
Patient Characteristics	The demographic distribution of the patients reflects the region, with greater numbers of Mexican-American Hispanics than other regions, and ~ 15 % African American patients. The age distribution is typical for dialysis.	The demographic distribution of the patients reflects the region, with greater numbers of Mexican-American Hispanics than other regions, and ~ 10 % African American patients. The age distribution is typical for dialysis.	Ethnically more than 50% Mexican American, ~ 10% African American.
Types of Clinical Encounters	Rounds in the outpatient dialysis unit setting. Occasional visits with peritoneal dialysis patients. Attendance at QI, short term and long term care plan meetings.	Scheduled clinic visits with nurses and faculty in the peritoneal dialysis clinic rotation.	New patient referral and consultation, established patient return clinic visits.
Procedures	Outpatient hemodialysis and peritoneal dialysis care.	Outpatient peritoneal dialysis care.	Performance of consultations. Urinalysis.

	University Outpatient Dialysis	Peritoneal Dialysis	Nephrology Clinic
Services	Dialysis Center of Lubbock	Redbud Dialysis Center	Nephrology Clinic, Texas Tech University Health Sciences Center
Reading Lists	Attached	Attached	Attached
Method of Evaluation	Online and oral evaluation by the attending nephrologists. Audit of quality reports to determine adherence to K/DOQI care guidelines. Plan 360 degree evaluation by dialysis center staff.	Written and oral evaluation by the attending nephrologists.	Online and oral evaluation of the fellows by the attending nephrologists. Plan semi-annual audit of clinic charts to determine fellow adherence to K/DOQI care guidelines

Nephrology Fellowship Year 1 – Competency Matrix

Year 1	UMC Consultation Service	Renal Transplant Service	Nephrology Clinic
Patient Care	Diagnoses acute kidney injury and defines its cause. Chooses correct treatment for patient with acute kidney injury based on patient needs. Orders dialysis and CRRT treatment correctly, manages their complications, and adjusts treatment as needed. Chooses appropriate access modality. Recognizes and treats dialysis access infections and access failure in chronic dialysis patients (HD and PD). Recognizes chronic kidney disease in previously undiagnosed patients and treats this effectively. Diagnoses and treats patients with nephrotic syndrome, acute and chronic glomerulonephritis and rapidly progressive glomerulonephritis, interstitial nephritis and other renal disease. Adjusts medication use based on kidney function.	Correctly manages immunosuppressive treatment in the post transplant period and in chronic transplant patients under the guidance of the attending physician. Diagnoses and treats acute and chronic rejection and infections in transplant patients, especially CMV and BK virus. Diagnoses lymphocoele, urinoma, vascular disorders and ureteral obstruction in the transplant setting. Recognizes recurrent FSGS, MPGN, IgA nephropathy, and diabetes. Manages HTN, diabetes and lipid disorders. Diagnoses and treats steroid related complications, including aseptic necrosis and osteoporosis. Recognizes post transplant malignancy and post transplant lymphoproliferative disease. Manages post transplant anemia. Treats CKD in transplants appropriately.	Appropriately uses imaging techniques in work up of renal disorders. Orders serological tests when indicated and interprets results correctly. Recommends renal biopsy when indicated and arranges for procedure. Controls blood pressure and treats proteinuria to reduce progression of renal disease. Correctly prescribes phosphate binders, vitamin D, and alkali treatment. Manages secondary complications of CKD. Pays careful attention to vascular disease in CKD patients. Helps patients choose best ESRD care option; arranges for transplant work up; ensures timely placement of dialysis access.
Medical Knowledge	Demonstrates knowledge of acute and chronic kidney diseases and electrolyte disorders and their treatment as outlined in Table A.	Demonstrates knowledge of basic transplant immunology, immunosuppressive therapies, transplant surgery complications, causes of renal dysfunction in post transplant period, acute and chronic rejection and viral and bacterial infections as outlined in Table B.	Demonstrates knowledge of the K/DOQI guidelines for chronic renal disease. Demonstrates knowledge of treatment of glomerular and tubular diseases, polycystic diseases, and renal diseases associated with systemic illnesses as outlined in Table C.
Practice Based Learning	Researches literature related to individual patient issues as needed. Incorporates new information in practice. Utilizes Up to Date and search engines as required.	Adapts to use of newly introduced medications and protocols as these are developed. Uses literature searches as required. Incorporates new information in practice.	Incorporates K/DOQI guidelines into practice as these are developed. Applies latest information about treatment in glomerular and interstitial disease.

Interpersonal and Communication Skills	Effectively explains the syndrome of acute kidney injury and its risks for death and chronic kidney disease to patients and families. Explains risks and benefits of dialysis and CRRT treatment. Writes or dictates clear opinions and recommendations to referring physicians. Explains long term plans for management of CKD and ESRD to referring physicians.	Effectively explains risks and benefits of transplantation and donation, importance of patient compliance, and medication side effects to patients. Helps patients understand and accept complications such as acne and Cushingoid appearance.	Effectively explains the risks of early renal disease, and the need for interventions. Clearly outlines treatment options. Explains biopsy risks and benefit. Explains biopsy results and their meaning. Writes or dictates clear opinions and recommendations to referring physicians. Clearly explains treatments for anemia, renal bone disease, hypertension, and reduction of proteinuria.
Professionalism and Ethics	Bases decisions about the need for dialysis on patient welfare and prognosis. Accepts patient rejection of dialysis or other treatments while maintaining therapeutic relationship. Comports self in hospital in professional manner.	Demonstrates understanding of significant ethical issues related to kidney transplantation, including organ allocation issues, donor payment, “non-beating heart” donors, xeno-transplantation, and drug costs. Understands issues in donor selection and recipient approval and listing process.	Is prompt and courteous; keeps effective records; responds to referring MD; applies best care options. Recognizes influences of physician based issues on ESRD choice and avoids decisions based on physician rather than patient benefit.
Systems Based Practice	Schedules dialysis with attention to nurse staffing, including avoidance of admission by arranging outpatient treatments. Arranges appointments after discharge as needed. Assures continuity of care by interactions with dialysis units and clinics. Plans for access placement in new ESRD patients. Understands and uses PD as a bridge to transplant or HD via permanent access. Avoids use of permanent catheters whenever possible.	Takes an active role in transplant related meetings, interacts with transplant office to allow continuity of care. Uses cardiovascular, dermatology, orthopedic, pulmonary, infectious disease, and endocrine consultation as needed. Develops skills needed to utilize the computerized data base to analyze current trends in patient outcomes. Actively participates with transplant surgeon and nephrologists in decisions regarding immunosuppression.	Develops understanding of interactions of specialty and primary care clinics regarding care of chronic kidney disease patients. Replies to consults in a manner that guides care by primary physician. Prepares patients for ESRD treatment and avoids need for emergent or urgent institution of dialysis. Arranges for access placement in sufficient time to allow fistula maturation to occur.

Nephrology Fellowship Year 2 – Competency Matrix

Year 2	University Associated Dialysis	Peritoneal Dialysis	Nephrology Clinic
Patient Care	<p>Provides safe and effective hemodialysis treatment in the outpatient setting. Orders and manages dialysis treatment so that K/DOQI treatment goals are achieved, including dialysis adequacy (KT/V), anemia, iron balance, Ca, Phos, Ca x Phos, PTH, K, bicarbonate, albumin, blood pressure, and treatment compliance targets. Addresses acute medical problems on dialysis effectively. Monitors access issues and arranges for correction of problems.</p>	<p>Provides safe and effective care of peritoneal dialysis patients, including adequate peritoneal clearance, glycemic control, volume and blood pressure control, iron, anemia, albumin and electrolyte control. Treats peritonitis and catheter infections effectively.</p>	<p>Appropriately uses imaging techniques and serological tests and interprets results correctly. Recommends and arranges renal biopsy when indicated. Controls BP, and treats proteinuria. Correctly prescribes phosphate binders, vitamin D, and alkali treatment. Manages all secondary complications of CKD. Addresses vascular disease in CKD patients. Helps patients choose best ESRD care option; arranges for transplant work up; ensures timely placement of dialysis access.</p>
Medical Knowledge	<p>Demonstrates knowledge of hemodialysis techniques and kinetics, the principles of renal bone disease and its treatment, and the causes and treatment of anemia in the dialysis patient. Demonstrates understanding of nutritional needs of dialysis patients and renal dietary interventions. Demonstrates understanding of issues of vascular access and importance of monitoring access as well as access choice.</p>	<p>Demonstrates knowledge of peritoneal dialysis including PET tests, weekly clearance, residual function, and membrane transport characteristics. Demonstrates knowledge of nutritional needs of PD patients.</p>	<p>Demonstrates knowledge of the K/DOQI guidelines for chronic renal disease. Demonstrates knowledge of treatment of glomerular and tubular diseases, polycystic diseases, and renal diseases associated with systemic illnesses.</p>
Practice Based Learning	<p>Alters treatment plans in response to patient outcomes with regard to targets. Adapts to use of bone disease and anemia algorithms. Changes prescribing practices as needed to achieve unit therapeutic goals for adequacy, anemia, bone disease and nutrition.</p>	<p>Alters treatment plans in response to patient outcomes with regard to targets. Adapts to use of bone disease and anemia algorithms. Changes prescribing practices as needed to achieve unit therapeutic goals for adequacy, anemia, bone disease and nutrition.</p>	<p>Incorporates new K/DOQI guidelines into practice as these are developed. Applies new information about treatment in glomerular and interstitial disease.</p>

Interpersonal and Communication Skills	Effectively explains importance of treatment compliance, nutritional recommendations, and proper dialysis access to patients and caregivers.	Effectively explains importance of treatment compliance, nutritional recommendations, and proper dialysis access to patients and caregivers.	Effectively explains the risks of early renal disease, and the need for interventions. Clearly outlines treatment options. Explains biopsy risks and benefit. Explains biopsy results and their meaning. Writes or dictates clear opinions and recommendations to referring physicians.
Professionalism and Ethics	Interacts effectively with dietitians, social workers, nurses and technicians during rounds and meetings to ensure care is safe and appropriate. Rounds on patients in timely and efficient manner, answering patient questions, and addressing issues. Is courteous, discreet, and appropriate at all times.	Interacts effectively with dietitians, social workers, nurses and technicians during rounds and meetings to ensure care is safe and appropriate. Rounds on patients in timely and efficient manner, answering patient questions, and addressing issues. Is courteous, discreet, and appropriate at all times.	Is prompt and courteous; keeps effective records; responds to referring MD; applies best care options. Recognizes influences of physician based issues on ESRD choice and avoids decisions based on physician rather than patient benefit.
Systems Based Practice	Exhibits knowledge of governmental, corporate, and unit guidelines and regulations. Works with dietitians and nurses in applying algorithms to achieve bone disease and anemia guidelines. Attends care plan and QI meetings as invited, participates in decisions regarding long and short term patient plans, and reviews issues affecting water treatment, safety, and unit goal setting. Develops understanding of governmental regulations and organizational guidelines for dialysis care and dialysis unit management.	Exhibits knowledge of governmental, corporate, and unit guidelines and regulations. Works with dietitians and nurses in applying algorithms to achieve bone disease and anemia guidelines. Attends care plan and QI meetings as invited, participates in decisions regarding long and short term patient plans, and reviews issues affecting safety and unit goal setting. Develops understanding of governmental regulations and organizational guidelines for dialysis care and dialysis unit management.	Understands the problems interactions of specialty and primary care clinics regarding care of chronic kidney disease patients. Develops plans to increase attention to CKD and early intervention. Replies to consults in a manner that guides care by primary physician. Stresses preparation for ESRD treatment and avoids emergent or urgent institution of dialysis. Arranges for access placement in sufficient time to allow fistula maturation to occur.

