I. Educational Purpose and Goals

The rotation will provide an in-patient and out-patient consultative experience in nephrology. In the changing scope of internal medicine practice with managed care, internal medicine residents need to become comfortable with the initial evaluation and long-term management of patients with both acute and chronic renal diseases, hypertension, fluid and electrolyte abnormalities, and acid-base disturbances.

II. Principal Teaching Methods

A. Supervised Direct Patient Care:

Residents will learn through direct patient care with fellow and attending supervision in the inpatient setting. Residents will be responsible for primary evaluation of patients and development of an initial assessment and plan. The resident will present the patient to the fellow(s) for discussion during work rounds and to the attending for discussion during teaching and management rounds. Residents are responsible for the initial written and dictated consultation notes.

B. Didactic Lectures: Didactic case discussions with resident involvement will occur during teaching rounds. Residents are also required to attend weekly Grand Rounds and Journal Clubs as well as the weekly fellows’ clinical conference.

C. Independent Reading: The resident will read independently to answer questions about patient care that arise in clinics. The residents may use UpToDate, primary literature or other sources suggested by preceptors.

III. Educational Content

A. Mix of Diseases: Diseases seen in this patient population cover the breadth of nephrology from common problems such as diabetic nephropathy, chronic renal insufficiency, hypertension, proteinuria, hematuria, hyponatremia, metabolic acidosis, and acute renal failure, to less common disorders such as nephrotic syndrome, rapidly progressive glomerulonephritis, pulmonary-renal syndrome, and thrombotic thrombocytopenic purpura.

B. Patient Characteristics: Because of the diverse patient population in Sacramento and the wide geographic referral area, patients may present in the early stages of the disease or be referred when it is advanced. Patients range in age from late teens to 80-100. Both sexes are well represented.
C. Procedures and Services: Nephrology consults on hospitalized patients on both the surgical and medical services, as well as in the various intensive care units. Basic procedures include urine sediment examination and central venous dialysis catheter placement in the femoral, internal jugular, or rarely, subclavian vein.

D. Learning Venues:

1. Conferences:
   a. Attendance at medicine core conferences and medicine grand rounds are mandatory.
   b. Attendance at medicine morning report is optional, as time permits.
   c. Nephrology Journal Club/Research Conference at La Bou (Optional): Tuesday @ 0730-0830
   d. Nephrology Grand Rounds at La Bou (required): Tuesday @ 0830-0930
   e. Nephrology Clinical Case Conference (when scheduled, PSSB 1st floor): Friday @ 1300

2. Nephrology Grand Rounds: Consist of a mixture of 1) interdisciplinary conferences with pathology to review the nephropathology for patients who had undergone renal biopsy in the preceding 2-3 months and with urology to discuss interesting cases requiring both urologic and nephrologic expertise; 2) in-depth didactic lectures on specific topics; and 3) clinic case presentations with in-depth discussion of controversial topics. Topics covered range from common diseases such as hypertension, diabetic nephropathy, metabolic acidosis, hyponatremia, peritoneal dialysis-associated peritonitis, and cardiovascular mortality and nutritional status in dialysis patients to unusual diseases such as retroperitoneal fibrosis and fibrillary glomerulonephritis.

3. Nephrology Journal Club and Research Conference: Alternates between discussion of recent journal articles to presentation of research ideas and findings. Journal club topics range from clinical trials evaluating the efficacy of antihypertensive medications to epidemiologic studies assessing the risk factors for mortality in dialysis patients to basic science articles defining and refining renal physiology such as the mechanism via which atrial natriuretic peptide causes natriuresis. Research conference topics range from the pathophysiology underlying the hyperlipidemia of nephrotic syndrome to the signaling pathway of vascular smooth muscle cell proliferation to the computer modeling of adequacy of dialysis to the clinical outcome of patients with renal failure treated with prolonged gentle dialysis.

4. Clinical Case Conferences: Provides a forum for patient-based discussion of both common and unusual clinical diseases in nephrology. After the fellow or resident presents a patient case as an unknown, the clinical nephrology attendings present will discuss the case focusing on an approach to diagnosis and management of the disease, clinical pearls, and important issues to consider in the clinical management of the patient. The diseases covered include non-diabetic renal disease in patients with diabetes, nephrotic syndrome, acute renal failure in the transplant patient, acute interstitial nephritis, hyponatremia, hematuria, peritonitis, and acute renal failure. During the academic year, some of these sessions will be devoted to transplant immunology or renal physiology.

5. Attending Rounds: The nephrology attending and fellow will make combined management and teaching rounds with the resident(s) on nephrology on a daily basis. This will include approximately 1 hour of teaching and up to 1.5 hours of management rounds. There will be a total of 5 hours/week of teaching rounds. Rounds will include bedside teaching, in-depth presentation and discussion of 1-3 cases, and demonstration and evaluation of the resident(s)’ interview and physical examination skill. Resident(s) are to leave by 1220 on Monday to
ensure his/her attendance at medicine core conference.

IV. Educational Goals and Objectives

By the end of the rotation, the internal medicine resident will be familiar with the evaluation and treatment of common renal diseases encountered in both the in-patient and out-patient setting. Specifically, the resident will gain proficiency in the rotation-specific competencies outlined below. As residents rotate on this rotation during their PGY1, PGY2, or PGY3 year, there are not PGY-year specific competencies for this rotation.

A. Rotation specific competencies:

Patient Care: By the end of the rotation, residents will be able to:

- Obtain accurate and complete information through medical interviews, physical examination, medical records review;
- Perform procedures for which they are signed off on safely and considerately;
- Present a case thoroughly yet concisely;
- Synthesize a complete problem list and appropriate differential diagnosis based on available data.
- Demonstrates sound clinical judgment; incorporating patient preferences into the care plan.
- Be able to do an demonstrate appropriate initial evaluation and management of acute and chronic renal failure.
- Demonstrate ability to evaluate and manage common fluid, electrolyte, and acid-base disorders.
- Interpret a urinalysis and perform a urine sediment examination.
- Complete an initial evaluation and management of urinary abnormalities, specifically hematuria and proteinuria, including nephrotic range proteinuria.
- Diagnose and manage diabetic nephropathy.
- Be able to manage patients with CKD5 on dialysis, with the exception of writing dialysis orders.
- Be able to evaluate and manage essential hypertension; understand when to search for secondary hypertension and be able to initiate an appropriate evaluation.
- Be able to evaluate renal function.

Medical Knowledge: By the end of the rotation, residents will be able to:

- Describe an approach to patients with acute renal failure and glomerulonephritis.
- Know the pharmacology of commonly used medications for hypertension and fluid balance, including ACEI, ARB, furosemide, thiazides, spironolactone, beta-blockers, clonidine.
- Applies an open minded and analytical approach to acquiring knowledge.
- Accesses and critically evaluates current medical information and scientific evidence.
- Have rudimentary understanding of the principles of dialysis.

Practice-Based Learning and Teaching:

- Critiques own performance;
- Receptive to constructive criticism;
- Learns from errors and uses errors to improve patient care on both a personal and system-wide level.
• Uses information sources effectively to support patient care decisions and to educate self, patients, and other physicians
• Active participation during interactive teaching sessions and case discussions
• Responsiveness to constructive criticism and enthusiasm for self-education and self improvement (practice based learning).

Interpersonal and Communication Skills:

• Develops a good working relationship and rapport and communicates clearly with other physicians, health professionals, and patients
• Presents cases concisely and in a well-thought out manner
• Maintains comprehensive, timely and legible medical records
• Communicates directly with consulting services after completion of consultation to relay clinical recommendations.

Professionalism

• Develops good rapport with patients and staff.
• Able to work with people from diverse backgrounds (professionalism).
• Demonstrates respect, compassion and integrity in working with patients, families, colleagues and other health professionals regardless of their background
• Adheres to principles of confidentiality, scientific and academic integrity and informed consent
• Recognizes and identifies deficiencies in peer performance in a constructive manner
• Takes responsibility for patient care; acknowledges mistakes

Systems-Based Practice

• Able to work with within the local, regional, and national medical system to deliver optimal patient care
• Participates actively in improving the health systems to optimize patient care
• Demonstrates appropriateness and cost-effectiveness of proposed diagnostic studies and therapeutic maneuvers.

V. Ancillary Educational Materials

A. Reading lists or other materials: There is a binder with review articles of common and important diseases in nephrology in the Fellow Office, labeled Nephrology Resident Curriculum.

B. Pathological Material: There will be a database with representative cases of renal pathology. In addition, the residents will be able to access reference pathology books to help guide their approach to renal pathology.

C. Computer-based Resources: Access to Up-to-Date in Nephrology is available via the computer in the Fellow Office. Online texts, the UC Davis Library, and Pubmed with access to electronic journals are available from any computer terminal.

D. Textbooks: Basic text books of nephrology are available in the Nephrology Fellow Office on South 3 of the main hospital.

VI. Methods of Evaluation
A. Resident Performance: Resident performance will be assessed through direct observation on teaching and management rounds, active participation during discussions on teaching rounds, chart audit and review, and input from the fellow, peers, and support personnel. The attending will evaluate the resident in writing at the end of the rotation and provide verbal feedback during and at the end of the rotation using E-Value. Continuous feedback will be provided on a day-to-day basis as needed.

B. Rotation, Faculty, and Fellow Evaluations: The residents will evaluate the rotation, the fellow, and each attending at the end of the rotation using E-Value.

VII. Supervision

Residents will work in direct contact with the Nephrology fellow and the acute service attending when they are on the medial wards. They will be expected to present, discuss and formulate a medical plan for each patient with the team. The attending and/or fellow are available 24 hours daily for assistance.

VIII. Resident Schedule

A. Structure and Duration of Teaching Rounds: The nephrology consultation rotation will consist of an in-patient and out-patient component. In the morning, the resident will round on their assigned in-patients, make work rounds with the renal fellow(s), then round with the attending. On Tuesday afternoon, the resident will attend renal clinic either at Mather VA or at UCDMC. Work hours will not exceed 80 hours per week, and the resident will have 1 day off a week on average. Moonlighting is discouraged during this rotation because of the intense nature of the educational experience. If moonlighting is authorized by the Nephrology attending and the Internal Medicine Residency Program Director, the resident must report all hours worked, which are included in the 80-hour work-week.

B. Daily Schedule:

Monday – Friday 0700-0900 Pre-round and Work Rounds
Monday – Friday 0930-1200 Combined Teaching and Management Rounds with Attending
Monday 1230-1530 Medicine Core Conference
Tuesday 1300-1700 Nephrology Clinic
Tuesday 0800-0900 Nephrology Grand Rounds
Thursday 0800-0900 Medicine Grand Rounds
Friday (~every other week) 1300-1400 Nephrology Clinical Case Conference

C. Patient Care Responsibilities: The nephrology fellow(s) will assign patients to the resident rotating through nephrology for evaluation as consults come in. The fellow(s) will review all consults for their potential teaching value in making these assignments. The resident will continue to follow patients assigned to him/her on a daily basis until continued renal care is no longer necessary. On all consults, the resident is expected to:

1. Perform a thorough history and physical examination.
2. Examine the urine sediment with the attending or fellow(s).
3. Formulate a differential diagnosis and management recommendations independently before discussion with the fellow(s) and attending.
4. Participate actively in the management of the patient and discussions concerning the patient.
5. Maintain an up-to-date flow sheet on each patient (generally, electrolytes, Ca, Mg, phosphate, CBC, BUN, Cr), or at least be able to report the trend of these laboratory values.
6. Pre-round on the patients you are following before work rounds with the fellow(s) and attending teaching rounds.
7. Write a daily note on each patient he/she is following.
8. Contact the primary team directly about any urgent management issues decided during work and attending rounds.

**D. Resident Clinic Responsibilities**  The resident must attend Tuesday afternoon out-patient renal clinic every week, unless his/her continuity clinic is on Tuesday afternoon.

- Tuesday 1300-1700 at Ambulatory Care Clinic with Dr. Depner OR
- Tuesday 1300-1700 at Sacramento VA Nephrology Clinic with Drs. Kaysen and Weiss

The resident will see new and return clinic patients. A thorough history (including a Review of Systems), physical exam, and urine sediment examination are required on all new patients. Urine sediment examination may also be needed on return patients. All patients will be reviewed and discussed with the attending prior to discharge from the clinic.

**IX. Duty Hours**

During this rotation, shifts are 12 hours or less and there is no in-house call activity. The schedules are arranged so that there are greater than 10 hours between all shifts. All residents get a minimum of 1 in 7 days free from responsibilities averaged over the four week rotation. Duty hours are limited to less than 80 hours per week.