UCLA-OLIVE VIEW INTERNAL MEDICINE RESIDENCY

NEPHROLOGY CONSULT CURRICULUM

Target: PGY 1-3
Updated September 2018

A. EDUCATIONAL OVERVIEW

Residents on the nephrology rotation are expected to gain competency in the management of hypertension, chronic kidney diseases and associated complications, common kidney diseases, and electrolyte disorders in both the inpatient and outpatient settings. With the guidance of the nephrology faculty, residents will also gain a more in-depth understanding of the evaluation and management of more complex cases during this rotation.

B. ROTATION DESCRIPTION AND STRUCTURE

Training on the nephrology consult service will take place at the Olive View-UCLA Medical Center, and spans the three years of training. It is composed of clinical experiences on the inpatient consult service and outpatient clinic. Rotations on the inpatient consult service are two weeks in length. Outpatient nephrology clinic is assigned during Ambulatory Medicine week and during the inpatient consult rotation. Trainees care for patients with acute and chronic diseases involving the renal system, including kidney diseases and electrolyte abnormalities. Supervision is provided by the Nephrology faculty and assisted by the Nephrology fellow(s).

C. GOALS & OBJECTIVES

Residents are expected to achieve the common goals and objectives of clinical care (see separate document) in addition to the following goals and objectives by the completion of training. Some goals are expected to be met by completion of the first year of training.

1. **Goal: Evaluate and manage common renal-related complaints, including edema, hematuria, proteinuria, and dysuria.**
    - Collect a focused, detailed history that includes the progression of symptoms and lab findings, medical history, and social history. (PC1)
    - Develop a differential diagnosis that localizes the site (e.g. glomerulus, interstitium, bladder), and etiology of pathology (e.g. glomerulonephritis, vasculitis, infection). (PC1, MK1)
    - Order additional testing with a cost-effective approach to elucidate the etiology. (PC1-2, SBP3)

2. **Goal: Identify and assess renal insufficiency to diagnose acute kidney injury (AKI), chronic kidney disease (CKD), and AKI on CKD (PGY 1).**
    - Define and differentiate between AKI, CKD, and AKI on CKD using laboratory data and urinalysis. (PC1, MK1)
    - Collect focused, detailed information that provides evidence for acute versus chronic kidney injury, the rate and time course of injury, and the etiology of kidney injury, including volume status, risk factors, exposures, and other associated symptoms. (PC1, MK1)
    - Order additional testing or therapeutic interventions (*e.g.* fluids) when appropriate to differentiate between AKI and CKD. (PC1/2)

3. **Goal: Evaluate and manage <u>chronic kidney disease (CKD)</u> and its complications (PGY 1).**
    - Order additional testing with a cost-effective approach to determine the etiology of CKD. (PC2/3, MK1, SBP3)
    - Monitor for CKD progression and implement management to slow progression (see goal #5). (PC2/3)
    - Monitor for, identify and treat complications of CKD, including hypertension, anemia, gout, secondary hyperparathyroidism, acquired cystic kidney disease, and kidney cancer. (PC2/3, MK1)
    - Describe the indications for renal replacement therapy (RRT, e.g. hemodialysis or peritoneal dialysis) and recommend RRT to patients in a timely manner when indicated. (PC2/3/5, MK1)
    - Adjust management of other medical problems according to the level of renal insufficiency, including medication dosing. (PC2/3, MK1)
    - Effectively counsel patients in the earliest stages about the significance of CKD and recommendations for management. (PC2/3, ICS1, PROF3)

4. **Goal: Evaluate and manage <u>acute kidney injury (AKI)</u> and its complications (PGY 1).**
    - Monitor for, identify and treat complications of AKI, including edema, hyperkalemia, hyperphosphatemia, acidosis, and post-ATN or post-obstructive diuresis. (PC2/3, MK1)
    - Adjust management of other medical problems according to the level of renal insufficiency, including medication dosing. (PC2/3, MK1)
    - Describe emergent indications for RRT and recommend RRT in a timely manner when indicated. (PC2/3/5, MK1)
    - Order additional testing to differentiate the category (e.g. pre-renal, intrinsic, or post-renal) of AKI. (PC2/3, MK1)

5. **Goal: Recommend management that reduces the risk and progression of renal insufficiency (PGY 1).**
    - Recommend evidence-based therapies to slow the progression of CKD (e.g. blood pressure control, diabetes control, use of renin-angiotensin-aldosterone inhibitors, alkalinizing therapy).
    - Avoid and counsel patients to avoid nephrotoxic substances. (PC2/3, MK1, PROF3, ICS1)
    - Optimize the contributing factors and risks for CKD progression, including control of hypertension and diabetes. (PC2/3, MK1)

6. **Goal: Evaluate and manage <u>metabolic, acid-base, and electrolyte abnormalities</u> with particular attention to identifying the underlying etiology (PGY 1).**
    - Accurately interpret the blood gas and chemistry with systematic approach to identify the acid-base disorder(s). (PC1, MK1)
    - Integrate a focused history and exam with acid-base interpretation to determine the etiology of the acid-base disturbance(s). (PC1/2, MK1)
    - Order additional serum and urine tests to differentiate the causes of the patient's electrolyte abnormality (e.g. appropriate urine electrolytes). (PC1/2, MK1)

7. **Goal: Evaluate and manage patients with <u>proteinuria</u>.**
    - Assess the severity of proteinuria (e.g. albuminuria, non-albuminuric proteinuria, nephrotic-range proteinuria) based on lab tests and symptoms. (PC1, MK1)
    - Describe the potential causes of proteinuria, and use additional history and laboratory tests to determine the patient's etiology. (PC1/2, MK1)
    - Refer appropriate patients for subspecialty care to treat the underlying etiology of proteinuria. (PC2/3/5)

8. **Goal: Evaluate and manage patients with <u>hyponatremia</u>.**
    - Assess the patient's severity of hyponatremia based on lab tests and symptoms. (PC1, MK1)
    - Interpret the history, exam, and lab findings to determine the etiology of hyponatremia. (PC1/2, MK1)
    - Describe appropriate management goals and monitoring for correction of hyponatremia, and the risk of overcorrection (i.e. osmotic demyelination syndrome). (PC2/3, MK1)
    - Recommend appropriate treatment of hyponatremia based on etiology and management goals, including type and rate of fluids and dietary changes (PC2, MK1).

9. **Goal: Evaluate and manage patients with <u>nephrolithiasis</u>.**
    - Order and interpret additional serum/urine tests to determine the patient's risk and type of nephrolithiasis. (PC1/2, MK1)
    - Recommend appropriate dietary, lifestyle, and pharmacologic treatment to reduce the risk/recurrence of nephrolithiasis. (PC2, MK1, ICS1, PROF3)
    - Refer appropriate patients to subspecialists, including urology, to manage complications of nephrolithiasis. (PC3/5)

10. **Goal: Understand the treatment options for patients with <u>glomerular and interstitial kidney diseases</u>.**
    - Explain the cause, risk factors, and work-up of patients with suspected glomerular and interstitial kidney diseases. (PC1/2, MK1)
    - Describe the appropriate use and monitoring of common immunosuppressive therapy when indicated for glomerular and interstitial kidney disease. (PC1, MK1)

11. **Goal: Co-manage patients with <u>renal transplantation</u>.**
    - Describe the appropriate use and monitoring of common immunosuppressive therapy after renal transplant. (PC1, MK1)
    - Identify common causes of AKI and transplant failure after renal transplant. (PC1, MK1)

12. **Goal: Understand the relationship between <u>Pregnancy and Renal Disease</u>.**
    - Describe the normal physiologic changes in renal function and water and electrolyte balance during pregnancy. (MK1)

- For hypertension during pregnancy, evaluate and recommend appropriate treatment of hypertension including associated eclampsia and pre-eclampsia. (PC1, MK1)
- Identify common causes of AKI during pregnancy. (PC1, MK1)

D. CORE TOPICS IN NEPHROLOGY

- Acute Kidney Injury (AKI)
    - Pre-renal
    - Post-renal
    - Intra-renal
        - Acute tubular necrosis (ATN)
        - Interstitial nephritis
        - Glomerular diseases
        - Vasculitis
        - Atheroembolic diseases
    - AKI in cancer patients
    - AKI in HIV/AIDS patients
- Chronic Kidney Disease (CKD)
    - Complications: gout, hypertension, anemia, secondary hyperparathyroidism, cardiovascular complications, acquired cystic kidney disease, kidney cancer
    - Pre-end-stage kidney disease
    - Dialysis: hemodialysis, peritoneal dialysis
    - Kidney Transplantation
- Fluid and Electrolyte Abnormalities
    - Sodium: hyponatremia, hypernatremia
    - Potassium: hypokalemia, hyperkalemia
    - Phosphorus
    - Magnesium
    - Calcium: hypocalcemia, hypercalcemia
    - Volume states: edema, volume depletion
- Renal Physiology and Renal Tubular Acidosis (RTA)
- Glomerular disease
    - Nephritis syndrome
    - Nephrotic syndrome
    - Acute Glomerulonephritis
        - ANCA-associated glomerulonephritis

- Granulomatosis with polyangiitis (GPA; Wegener's)
- Microscopic polyangiitis (MPA)
- Eosinophilic granulomatosis with polyangiitis (EGPA; Churg-Strauss)
- Non-specific pauci-immune glomerulonephritis

- Anti-GBM glomerulonephritis
- Immune complex-associated glomerulonephritis
  - Lupus nephritis
  - IgA nephropathy
  - Post-infectious glomerulonephritis
  - Membranoproliferative glomerulonephropathy (MPGN)
  - Cryoglobulinemia

- Nephrotic Syndrome: primary glomerular diseases
  - Minimal change disease
  - Membranous nephropathy
  - Focal and segmental sclerosis
  - IgA nephropathy

- Tubulointerstitial Diseases
  - Acute interstitial nephritis
  - Chronic interstitial nephritis
  - Chronic granulomatous interstitial nephritis
- Acid-Base Disorders
  - Metabolic acidosis: normal anion gap, high anion gap
  - Metabolic alkalosis: chloride-sensitive, chloride-resistant
  - Respiratory acidosis
  - Respiratory alkalosis
  - Mixed acid-base disorders
- Hypertension
  - Essential hypertension
  - Hypertensive crisis
  - Resistant hypertension
- Renal Nutrition
- Renal Disease in Pregnancy
  - Physiologic changes
  - Hypertension (eclampsia/pre-eclampsia)

    - Kidney injury in pregnancy
- Genetic Diseases of the Kidney
    - Alport disease
    - Polycystic kidney disease
    - Medullary disease
- Nephrolithiasis
- Renal pharmacology
    - Diuretics/Aquaretics
    - Nephrotoxic drugs
    - Erythropoeitin
    - Antihypertensive drugs

E. TEACHING METHODS

Clinical education is provided through direct patient care and case discussion rounds with the supervising attending physician and fellow. In addition, didactics will be provided during daily attending rounds and with the weekly core lecture series designed for residents.

Housestaff are required to attend the daily Noon Conference series and Morning Report when permitted by patient care duties.

Housestaff are expected to supplement their learning with additional reading on diseases encountered.

F. SUPERVISION AND EVALUATION

All housestaff and patient care will be supervised by the attending physician and fellow.

Residents will be evaluated by the supervising attending. Direct verbal feedback may be provided throughout the rotation, and written evaluation will be submitted electronically in MedHub at the end of the rotation. These can be reviewed by the resident at any time and will be reviewed with the housestaff during the Clinical Competency Committee meeting.

Direct observation and feedback of interviewing, examination, and/or counseling skills may be documented with the Mini-CEX.

G. EDUCATIONAL RESOURCES

Electronic resources are also available through the internet at Olive View-UCLA Medical Center and through UCLA.

- UpToDate
- Dynamed (coming)
- Harrison's Principles of Internal Medicine
- PubMed
- MKSAP

Suggested textbooks:

- Rose DB: Clinical Physiology of Acid-Base and Electrolyte Disorders

- Rose DB: Pathophysiology of Renal Disease
- Brenner & Rector: The Kidney
- Johnson R and Feehally J: Comprehensive Clinical Nephrology
- Pham & Pham: Nephrology and Hypertension: Board Review

Please also see the Resident Nephrology Rotation binder in the Renal Fellows' Workroom.