Nephrology Curriculum

The renal service includes the inpatient and outpatient management of patients with various stages of kidney disease including dialysis and renal transplantation, electrolyte disorders, acid/base disorders, and nephrolithiasis. The service also provides consultative service to University Hospital, Crouse Hospital, and the VA Hospital. The nephrology division includes the following individuals:

Sri Narsipur, MD – Medical Director of Dialysis Services, Director of Transplant Nephrology, Division Chief
Sylvia Betcher, PhD, MD – Chief of Nephrology at the VA Hospital
William C. Elliott, MD – Clinical Nephrologist
Rose Giammarco, MD – VA Nephrologist
Kimberly Gilbert, MD – Clinical Nephrologist
Apurv Khanna, MD – Clinical Nephrologist – Fellowship Director
Stephen Knohl, MD – Clinical Nephrologist, Residency Program Director for Department of Medicine
John Todd Leggat, MD – Transplant Nephrologist
Steven Scheinman, MD – Clinical Nephrologist
Guy Perry, PhD – Assistant Professor, Research

I. Educational Purpose

The general internist should be competent to evaluate and appropriately refer patients with glomerular disorders, asymptomatic urine abnormalities, tubulointerstitial diseases, renal vascular disease, renal failure, nephrolithiasis, tubular defects, and infections and neoplasms of the kidneys, bladder, and urethra, and should also be able to provide principle treatment for some of these conditions. He or she should be able to estimate the level of kidney function in a given individual and to manage fluid, electrolyte, and acid-base disorders; understand the ways in which systemic diseases may affect the kidneys; and recognize the potential nephrotoxicity of various therapeutic and diagnostic agents. The general internist must also be familiar with guidelines for pre-dialysis management of patients with kidney disease and be able to recognize indications for dialysis and for referral to a nephrologist.

II. Learning Venue

Rotation Description - The consult nephrology services are hospital-based services that include University Hospital, Crouse Hospital, and the VA Hospital. These locations will allow the housestaff officer to see medical and surgical patients ages 16 and older, of male and female gender, and of varying ethnicities/cultures. The services average 25-40 patients together (80% University, 15% VA, 5% Crouse) and consists of the attending, fellow/s, 1-2 housestaff officers, and 1-2 4th year medical students. Consult A service sees non-ICU patients at University Hospital and all transplant patients. Consult B service see ICU patients at University Hospital and all consult patients at Crouse and the VA Hospital.

Expectations of PGY-1: The intern will complete detailed history and physicals of referred patients and complete a progress note on a daily basis. He or she will follow an average of three patients. The intern will be expected to examine the urine (via dipstick and microscopically) during the initial evaluation or as needed as well as interpret basic laboratory and radiographic tests of renal function. Interns will also be
expected to teach the medical students on the service as well as further his/her own learning through the use of reading materials that are outlined below.

**Expectations of the Senior Resident:** Same as intern expectations, plus the senior resident will follow up to 6 patients. The senior resident should master the basic laboratory and radiographic evaluation of renal function as well as fulfill teaching responsibilities to the intern and medical students. The senior resident will continue to expand his or her knowledge of renal disease with the aid of the reading materials outlined below.

**Expectations of Fellow:** The first year fellow will supervise the interns, residents, and medical students on the consult services. The first year fellow is expected to know about all patients on his own service. He is expected to place dialysis orders, including hemodialysis, peritoneal dialysis, and continuous renal replacement orders. He is expected to review the presentations of the students and residents on the service, prior to presentation to the attending physician. He is expected to triage patients in order of necessity for dialysis. He is expected to write outpatient dialysis orders when patients are discharged.

**Teaching Methods:**
1. **Daily Attending Rounds**
   Here the entire team (students, housestaff, fellow, and attending) will discuss patient issues and formulate daily plans. The housestaff will be expected to have seen each of their assigned patients, collected all relevant data, and present in a concise, logical format to the attending. Rounds typically begin in the ICU for Consult B. Rounds will occur on the floors for Consult A and will vary depending on patient load and severity of disease.

   **Teaching Rounds**
   Here the attending will lead the team in various exercises to expand their knowledge of nephrology. Various formats, including bedside teaching, didactic sessions, focused presentations, and review of biopsy and urine specimens will often be incorporated during work rounds.

   **Bedside Rounds**
   Here the attending will supervise and guide the fellow, housestaff, and students in regards to proper history and physical exam techniques. These rounds are often integrated into teaching rounds.

2. **Recommended Reading:**
   - *Therapy in Nephrology and Hypertension: A Companion to Brenner and Rector’s “The Kidney”* edited by Hugh Brady and Christopher Wilcox
   - *Fluids and Electrolytes* edited by Juha P. Hokko, Richard L. Tannen
   - *The Principles and Practice of Nephrology* edited by Harry Jacobson, Gary E. Striker, Saulo Klahr
   - *Primer in Kidney Diseases*
   - *Massry & Glassock’s Textbook of Nephrology* edited by Shaul G. Massry, Richard J. Glassock
   - *The Kidney* by Brenner and Rector
   - *Replacement of Renal Function by Dialysis* edited by C. Jacobs...[et al.]
   - *Dialysis Therapy* edited by A. Nessenson and R. Fine
   - *Principles and Practice of Dialysis* edited by William L. Henrich
   - *Primer on Transplantation* edited by D. Norman and L. Turka
   - *Clinical Physiology of Acid-Base and Electrolyte Disorders* by B.D. Rose
   - *Pathophysiology of Renal Disease* by B.D. Rose
   - *The Kidney: Physiology and Pathophysiology* edited by D. Seldin and G. Giebish
   - *Handbook of Dialysis* edited by J. Daugirdas and T. Ing
   - *Handbook of Kidney Transplantation* edited by G. Danovitch
   - *Up-To-Date Online*

3. **Unique Learning Opportunities:**
   - Renal Conference (Tuesdays from 4-5PM) – didactic sessions covering all aspects of nephrology provided by the attending and fellows from adult and pediatric nephrology, transplantation, and nephropathology.
Journal Club/Physiology Conference (Wednesdays from 4-5 PM) – critical evaluation of articles relevant to nephrology. Once a month, the fellow will present a topic on renal physiology.

Case Conference (Thursdays from 12-1PM) – the fellows and residents present renal cases to the division for informal discussion and practical management issues.

Dialysis and Transplantation Committee Meeting (Fridays 8:30 -9AM) – discussion of currently hospitalized patients with end-stage renal disease or dialysis-requiring acute renal failure as well as any relevant transplant issues.

C. Mix of Diseases and Patient Characteristics

1. Common Clinical Presentations and Diseases:
   - Urine Abnormalities
   - Bladder Outlet Disease
   - Dysuria
   - Edema
   - Suprapubic/Flank Pain
   - Changes in Urinary Habits
   - Hematuria
   - Hypertension
   - Incontinence
   - Uremia
   - Renal Mass or Bruit
   - Acute Renal Failure
   - Chronic Kidney Disease
   - Nephrotic Syndrome
   - Glomerulonephritis
   - Electrolyte Dyscrasias (Hypernatremia, Hyponatremia, Hyperkalemia, Hypokalemia, Hypercalcemia, Hypocalcemia, Hypomagnesemia, Hyperphosphatemia, Hypophosphatemia)
   - Acid-Base Disorders
   - Renal Transplantation
   - Nephrolithiasis

2. Procedures:
   - Calculation of Creatinine Clearance
   - Calculation of Fractional Excretion of Sodium
   - Calculation of transtubular potassium gradient
   - Calculation of replacement fluids and electrolytes
   - Dipstick of Urine
   - Microscopic Analysis of Urine
   - Femoral Placement of Temporary Dialysis Access (optional)

Educational Content

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<th>Acid-base disorders</th>
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<tr>
<td><strong>Acute renal failure</strong></td>
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<td>Acute (ischemic) tubular necrosis</td>
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<td>Atheroembolic</td>
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<td>Drug-induced (radiocontrast, analgesics, etc.)</td>
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<td>Interstitial</td>
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<td><strong>Chronic renal failure</strong></td>
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<td>Conservative management (before dialysis)</td>
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<td>Hemodialysis</td>
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Fluid and electrolyte disorders

Glomerular diseases
- Acute glomerulonephritis
- Chronic glomerulonephritis
- Nephrotic syndrome

Hypertension (see also Cardiology)
- Hypertensive crisis
- Secondary hypertension

Inherited diseases
- Polycystic kidneys

Kidney disease in systemic illness
- Diabetes mellitus
- Hypertension

Other systemic diseases
- Polycystic kidneys

Diabetes mellitus
- Bladder carcinoma
- Renal cell carcinoma

Nephrolithiasis
- Diagnosis of renal stone disease
- Management of acute renal colic

Obstructive uropathy
- Renal disease in pregnancy (see Medical Consultation)

Urinary tract infection
- Cystitis
- Pyelonephritis

Urologic disorders
- Bladder outlet obstruction
- Cancer of the prostate (detection)
- Erectile dysfunction
- Incontinence
- Prostate disease

IV. Method of Evaluation

Evaluations are based on the six core competencies. Interim evaluations will be provided to each member of the team. All team members are expected to complete formal evaluations at the end of each rotation using the web-based E-Value evaluation software.

V. Rotation Specific Competency Objectives

Patient care – generic link to competency document
Medical knowledge – generic link to competency document
Professionalism – Frequent discussions relevant to end of life care and discontinuation of dialysis are relevant to the care of end stage renal patients and will be evaluated. - Generic link to competency document
Interpersonal and Communication skills – Consult services are by nature rotations that test a resident’s ‘people’ skills. When you are asked to consult on a patient, the many members of the ‘Team’ asking for help have varying attitudes about how much they value your opinion. Your performance on how well you do this is reflected by 1) the clarity of your consult summary of the case 2) the clarity of your consultative advice 3) the communication of that information to the “team” that has asked for your help. The evaluations in the daily notes should be diagnosis-based and start with the reason for the primary team asked for a consultation. Disagreements are inevitable and learning how to respond and react to this is one of the learning values of consultative medicine.
**Practice Based Learning** – generic link to competency document

**Systems Based Practice** – This rotation offers a unique opportunity to work in a cross specialty environment including ICU, transplant, surgical and psychiatric hospitalized services. In addition some patients will have long-term dialysis needs that need to be understood and coordinated by the consult team.

**Review of the ACGME Duty Hours**

ACGME Rules Regarding Duty Hours

The Work Day

No shift can be longer than 24 hours.

An additional 3 hours can be utilized to finish work that does not relate to direct patient care.

There must be 10 hours off between shifts during the Work Week

No work week (Sunday through Saturday) can exceed 80 hours under any circumstance.

Moonlighting (for fellows and chief residents) counts toward the 80 hours.

There must be a continuous 24 hours off per week.

Reviewed and Revised by: Margaret MacDougall-Rivers, MD, PhD

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