**Nephrology Rotation Curriculum:**

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|  | **Clinical evaluation of kidney function** * Biochemical markers of kidney function
* Interpretation of Urinalysis and urine microscopy
* Measurements of albumin and protein excretion and clinical assessment of proteinuria

**Hematuria and Kidney stones*** Know the definitions and the common etiologies of microscopic and gross hematuria.
* Understand why a urine dipstick positive for blood is inadequate to diagnose hematuria and why a microscopic analysis is essential. And what are the reasons for a false negative dipstick test and a false positive dipstick test.
* Know the risk factors for urologic malignancy in patients with microscopic or gross hematuria.
* Know the five categories of kidney stones and their prevalence. Know the clinical presentation and evaluation of the patient with suspected kidney stone, and its medical management. Understand the role of the urology consultant in the management of kidney stones.

**Acute kidney injury*** Definition and classification
* Etiologies: prerenal, ATN, AIN, pigment nephropathies, Acute GN, Acute vascular syndromes, CIN, Cardio-renal, hepato-renal, tumor lysis, abdominal compartment.
* Diagnostic work up in evaluating a patient with AKI
* Initial management of acute kidney injury including the type of fluid recommended in prerenal states, goal MAP, indication for diuretics, appropriate medication dosing, and indications for emergent renal replacement therapy.
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|  | **Hyperkalemia:** * Understand mechanisms that normally regulate body potassium.
* What are the EKG findings that may be seen in hyperkalemia.
* What are the common causes and of intermittent and chronic hyperkalemia including the common mechanisms for each drug induced.
* Know the laboratory evaluation that must be obtained to work up the hyperkalemic patient including urine studies and trans tubular gradient.
* Know acute management of the hyperkalemic patient including steps to stabilize the myocardial membrane, shift potassium into the cells, and lower the total body potassium. Know the appropriate doses, methods of delivery, and contraindications to calcium gluconate, insulin and glucose, beta-agonists, and kayexalate.

**Hyponatremia:*** understand several common physiologic and pathologic conditions that cause elevated levels of vasopressin resulting in hyponatremia.
* Know the definitions of acute and symptomatic hyponatremia versus chronic hyponatremia .
* Know the algorithm used to diagnose the cause of hyponatremia. Compare and contrast the pathophysiologic and laboratory differences in isovolemic, hypovolemic, and hypervolemic hyponatremia.
* Understand the treatment for acute symptomatic hyponatremia and how it differs from chronic hyponatremia including the neurologic consequences of mismanagement
* Understand Management of hypernatremia
* Understand the etiology, how to diagnose and treat both types of diabetes insipidus?

**Acid – base balance*** What is the diagnostic approach to evaluate Metabolic acidosis, including anion gap, delta delta gradient, winter's formula, plasma and urine osmolar gap…
* What are the causes of AGMA and how to manage each?
* What are the causes of NAGMA and how to differentiate between RTAs.
* What are the causes and management of metabolic alkalosis?
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|  | **Hypertension and Hyper aldosteronism*** Know JNC-8 guidelines for BP targets for patients aged ≥ 60 years old, < 60 years old, patients with chronic kidney disease and patients with diabetes.
* Know the first line anti-hypertensives for non-black patients and black patients *without* DM and CKD and *with* DM and CKD.
* What is and how to manage hypertensive urgency and emergency?
* Understand the SPRINT trial and its findings.
* What is a resistant hypertension and how to treat it?
* What are the etiologies of secondary HTN and how to investigate for?
* How to diagnose and treat primary hyperaldosteronism?

**Chronic Kidney Disease:*** Know the definitions for CKD and its 5 stages according to the National Kidney Foundation.
* Know the medications that CKD patients should avoid to prevent worsening of renal function.
* Know how to screen and manage CKD complications including HTN, CAD and HLD.
* What are the indications for lipid screening and treatment in patients with CKD.
* Know the indication for ACEI and ARB medications for the treatment of proteinuria and blood pressure goals for patients with CKD.
* Understand the Calcium and Phosphorus Homeostasis and CKD induced vitamin D deficiency and secondary hyper PTH and related mineral and bone disorder including osteoporosis and osteomalacia, Renal Osteodystrophy and Vascular Calcification
* Understand the risks of hyperphosphatemia and its management in patients with CKD.
* Know the recommendations for erythropoiesis-stimulating agents and optimal hemoglobin goals in patients with CKD as well as the risks of therapy.
* Know the definition of ESRD with basic understanding of peritoneal and hemodialysis and vascular accesses.
* How to care for kidney transplant patients including immune suppressive therapy, prophylactic antimicrobial and recommended vaccinations.
* Know the side effects of immune suppressive therapy.
* Acute kidney injury in transplanted patients and types of graft rejection.
* What are the infection likely to be seen in kidney transplanted patient?
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|  | **Glomerular diseases with Nephritic Syndromes:*** Understand the clinical manifestations of a nephritic syndrome and the urinalysis findings that should prompt an internist to think of these diagnoses.
* Know the classic clinical presentations and laboratory and kidney biopsy findings of :
	1. Rapidly progressive glomerulonephritis (RPGN)
	2. Anti-glomerular basement membrane antibody disease (Goodpasture’s)
	3. Pauci-Immune glomerulonephritis (ANCA positive)
	4. Immune complex-mediated glomerulonephritides (IgA nephropathy, Lupus, Post-Strep, Membranoproliferative GN, and Cryoglobulinemia.)

**Proteinuria/Nephrotic Syndrome:*** Know the normal limits of proteinuria and albuminuria in a 24 hour urine collection. Define nephrotic syndrome.
* Know the limitations of a dipstick test to diagnose proteinuria and the role of spot urine sampling for protein/creatinine ratio and albumin/creatinine ratio.
* Understand differential diagnosis of diseases that cause nephrotic range proteinuria and how to diagnose and manage each of them.
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|  | During this rotation, a resident is expected to: * Appropriately orders and interprets the results of uninalysis, renal ultrasound, and CT scan
* Demonstrates familiarity with common diagnostic & therapeutic procedures used in nephrology including post void residual, renal biopsy and fistulogram.
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