Title of Clerkship:	**Nephrology Elective – UTMC** (2 weeks)
Elective Year(s):	Fourth
Department:	Internal Medicine
Type of Elective:	Clinical ✓ Non-Clinical/Research ___ Basic Science ___
Clerkship Site:	The University of Toledo Medical Center
Course Number:	MEDI734
Blocks Available:	All
Number of Students per Block:	3 (combined total on both 2 and 4-week nephrology electives)
Faculty:	Zubia Alam, M.D., Maria Alfonso-Jaume, M.D., Lance Dworkin, M.D., Dinkar Kaw, M.D., Ph.D., Deepak Malhotra, M.D., Ph.D., Shobha Ratnam, M.D., Ph.D.
Elective Description / Requirements:	This elective consists of a mixture of inpatient consultation, and outpatient experiences. The student will have primary and/or consultative responsibility for patients who have a variety of acid-base and electrolyte disorders and problems in clinical nephrology and renal transplantation. The principal method of learning will be problem-based case analysis on inpatient/consultative rounds. The student will be directed to do in depth reading regarding his patients and selected topics. In addition, ad hoc seminars on relevant topics will be scheduled for the members of the Nephrology Service.
Length of Clerkship:	2 weeks
<u>Links to Core Competencies</u>	<u>Educational Course Objectives</u>
PC-8, PC-10	*After completing the rotation, the student will be able to:* Recognize problems in ill-structured clinical cases and formulate hypotheseses including: 1. Testing hypotheses using a logical construct 2. Proposing a therapeutic plan based on the above analysis. 3. Re-evaluate hypotheses on the basis of test results and/or response to treatment. 4. Identify basic science and clinical literature relevant to the problem at hand. 5. Recognize the elements of becoming a self-directed learner.
PC-4	Demonstrate the following skills: 1. 2. Write a concise consultation note clearly identifying the most likely diagnosis and therapeutic recommendations.
PC-3, PC4	Demonstrate appropriate behaviors and attitudes: 1. Perform a considerate examination and evaluation of the patient. 2. Explain to the patient and family members where appropriate the nature of the patient's condition and the patient's choices including: risks, benefits, and alternatives.
MK-1, MK-2, MK-4, MK-7, PC-7, PC-8	Demonstrate an understanding of the following Cognitive Objectives: 1. Hyponatremia/Hypernatremia/Body Fluids a. Describe the body control of sodium and water balance. b. Explain the ways sodium and water balance is independent and the ways they are dependent. c. Characterize from clinical information the patient's total body sodium (effective extra- cellular fluid volume) status. d. Distinguish true hypotonicity form pseudohyponatremia.

e. List the appropriate diagnostic tests and interpret the results to determine the pathogenesis of hyponatremia.
f. Choose fluids appropriate to clinical information.
g. Estimate water deficit from clinical information and choose appropriate fluids.
h. Evaluate edematous patient for pathogenesis and prescribe appropriate treatment.

2. Potassium Balance/Hypokalemia/Hyperkalemia
   a. Describe body balance of potassium.
   b. Describe the differential diagnosis for the hypokalemic state. Propose diagnostic tests to confirm diagnosis and recommend treatment.
   c. Distinguish pseudohyperkalemia from hyperkalemia and describe tests required to confirm impression.
   d. From clinical information determine the differential diagnosis of hyperkalemic state and propose tests to confirm pathogenesis and prescribe treatment.
   e. Describe the emergency treatment of hyperkalemia including themechanisms of action and relative speed and efficacy of these interventions.
3. Simple Acid-Base Disorders
   a. Describe the buffering system of the body and explain why bicarbonate is a good butter to maintain pH at 7.4 in vivo but a poor butter in vitro at the pH.
   b. Describe the body balance of H+, HCO3-, and CO2 for the body and describe the generation, elimination and measurement of these substances. Explain the differences between total CO1, pCO2, HCO3-.
   c. Identify the 4 simple acid-base disturbances from clinical information.
   d. Describe compensatory mechanisms for each simple disturbance.
   e. Explain why the Henderson-Hasselbalch Equation (ionization constant) does not predict the compensation expected and list 5 causes for each simple acid-base disturbance.
   f. Explain the difference between academia and acidosis.
   g. Explain how perpetuating factors make if difficult for the body to homeostatically correct metabolic alkalosis in the face of volume depletion.
   h. Describe the treatment of each of the primary acid-base disturbances and calculate the dosages of bicarbonate for metabolic acidosis.
4. Complex (Mixed) Acid-Base Disorders
   a. Explain the difference between simple and complex (or mixed) acid-base disturbances.
   b. Explain the predicted compensations for each of these acid-base disturbances.
   c. Explain why compensation never obliterates the primary acid-base disturbances.
   d. Identify mixed (or complex) acid-base disturbances from clinical material with the aid of confidence bands for simple disturbances.
   e. Propose treatment for mixed acid-base disturbances based on an understanding of the pathophysiology.
5. Describe the differential diagnosis and treatment of Acute Renal Failure
6. Describe the differential diagnosis and management of Chronic Renal Failure
7. Outline the dietary changes recommended for patients with Chronic Renal Failure
8. Describe the various dialysis options available for patients with Chronic Renal Failure
9. Recognize the role of renal transplantation in patients with renal failure
10. Define Interstitial nephritis and discuss the evaluation and management of this condition
11. List the causes of cystic diseases of the kidney
12. Discuss the role of the kidney in patients with Hypertension
13. Discuss the Evaluation and Management of Proteinuria, Obstructive Uropathy and Urinary Tract Infections

	UT/COM students will meet or exceed the institutional standards for professionalism as stated in the current Educational Program Objectives and the current Educational Course Objectives for the Sponsoring Department.
Instructional Methods:	Small group – clinical skills Interpretation of lab data Diagnostic tests – use/interpretation Lecture/media Independent study Outpatient rounds Inpatient rounds
Evaluation Methods Employed:	Attendance Case presentation Case write-up Faculty/resident evaluation Narrative
Prerequisites:	Successful completion of required Internal Medicine Clerkship
Clerkship Director:	Christopher Lynn, M.D.
Clerkship Coordinator: Phone Number: Email:	Dawn D. Jagodzinski 419-383-5022 dawn.jagodzinski@utoledo.edu