

**Title of Clerkship:** Nephrology Elective - Sandusky AHEC (4 Weeks)  
**Elective Type:** Fourth Year Elective  
**Department:** Internal Medicine  
**Clerkship Site:** Sandusky, Ohio  
**Course Number:** MEDI715  
**Blocks available:** By request through the AHEC Center Office.  
**Number of students per block:** 1  
**Faculty:** Various Preceptors  
**Elective Description/ Requirements:** A four week rotation for fourth year medical students interested in pursuing Nephrology as a specialty. There is a great opportunity for dialysis observation and management, and most of the rotation relates to etiology and management of chronic renal failure.

**Length of Clerkship:** 4 weeks

**Links to EPOs**  
S8, S11

**Educational Course Objectives:**

Process:

Perceive problems in ill-structured clinical cases.

Formulate Hypothesis(es) Based on Problems:

1. Test hypothesis(es) on a logical basis
2. Proposes therapeutic plan based on above analysis.
3. Re-evaluate hypothesis on basis of test results and/or response to treatment.
4. Search out basic science and clinical literature relevant to problem at hand.
5. Self-evaluate and become a self-directed learner.

S1, S5

Skills:

1. Perform a careful analysis of urine sediment in the context of a clinical problem.

S1, S3, S4

2. Write a concise consultation note clearly identifying the most likely diagnosis and therapeutic recommendations.

Behaviors/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.

K1, K2, K3, K4  
K5, K7, S7, S8

Cognitive Objectives:

1. Hyponatremia/Hypertatremia/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 from pseudohyponatremia.
- e. Order diagnostic tests and interpret to determine pathogenesis of hyponatremia.
- f. Prescribe fluids appropriate to clinical information.
- g. Estimate water deficit from clinical information and prescribe fluids.
- h. Evaluate edematous patient for pathogenesis and prescribe appropriate treatment.

2. Potassium Balance/Hypokalemia/Hyperkalemia

- a. Describe body balance of potassium.
- b. From clinical information determine differential diagnosis for hypokalemic state. Propose diagnostic tests to confirm diagnosis and recommend treatment.
- c. Distinguish pseudohyperkalemia from hyperkalemia, describe tests required to confirm impression.
- d. From clinical information determine the differential diagnosis of hyperkalemic state, propose tests to confirm pathogenesis and prescribe treatment.
- e. Describe the emergency treatment of hyperkalemia, mechanisms of action, relative speed and efficacy.

3. Simple Acid-Base Disorders

- a. Describe buffering system of the body and explain why bicarbonate is a good buffer to maintain pH at 7.4 in vivo but a poor buffer in vitro at the pH.
- b. Describe the body balance of H<sup>+</sup>, HCO<sub>3</sub><sup>-</sup>, and CO<sub>2</sub> for the body and describe the generation, elimination and measurement of these substances. Explain the differences between total CO<sub>2</sub>, pCO<sub>2</sub>, HCO<sub>3</sub><sup>-</sup>.
- c. Identify the 4 simple acid-base disturbances from clinical information.
- d. Describe compensatory mechanisms for each simple disturbance. Explain why the Henderson-Hasselbalch Equation (ionization constant) does not predict the compensation expected.
- e. List 5 causes for each simple acid-base disturbance.
- f. Explain the difference between acidemia and acidosis.
- g. Explain how perpetuating factors make it 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. 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 what predicted compensations.
  - 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. Acute Renal Failure
  - a. Differential Diagnosis
  - b. Treatment
6. Chronic Renal Failure
  - a. Search for reversible causes
  - b. Management
    1. Dietary
    2. Dialysis options
    3. Renal Transplantation
7. Interstitial nephritis
8. Cystic Diseases of the Kidney
9. Hypertension
10. Evaluation and Treatment of other Common Clinical Disorders
  - a. Proteinuria
  - b. Obstructive Uropathy
  - c. Urinary Tract Infections

**Professionalism:** UT/COM students will meet or exceed the institutional standards for professionalism as stated in the current Educational Program Objectives and the Educational Course Objectives for the Sponsoring Department.

**Instructional Methods:**

1. Small group – clinical skills
2. Interpretation of lab data
3. Diagnostic tests – use/interpretation
4. Independent study
5. Outpatient rounds
6. Inpatient rounds

**Evaluation methods employed:**

1. Formative review of clinical performance.
2. Faculty observation and evaluation.
3. Professional assessments
4. Attendance

**Prerequisites:** Successful completion of Internal Medicine clerkships.

**Sandusky AHEC Center**  
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**Special Requirements:** On call and other special requirements will be at the discretion of your preceptor. The student will be required to be in the physician's office during office hours each day unless otherwise specified by the preceptor

**AAMC Hot Topics Addressed in this Elective Clerkship:**