Back to Basics overviews: Chemistry

1 – *Water and Electrolytes*, by Dr. Pudek

Review the distribution and physiological mechanisms regulating water, sodium and potassium. Common pathological conditions such as hyponatremia, hypernatremia, hypokalemia and hyperkalemia illustrated with brief case histories will be discussed.

2 – *Disorders of Glucose Metabolism*, by Dr. Pudek

The metabolism and regulation of glucose will be reviewed. The causes, clinical features and diagnosis of diabetes mellitus and hypoglycemia will be examined and the abnormalities of carbohydrate metabolism will be illustrated with case examples.

3 – *Evaluation of Acid Base Status*, by Dr. Schreiber

Measurements of acid-base status are used to diagnose and monitor patients with a wide variety of conditions. Values for pH, pCO_2 and HCO_3^- allow one to determine which acid-base disorder (if any) is present. The specific cause of an acid-base disorder can usually be diagnosed from a combination of history, physical exam and additional lab tests. This talk will briefly review acid-base physiology, and then discuss how laboratory data are interpreted to give a clinically meaningful result.

4 – *Lipoprotein Metabolism*, by Dr. Holmes

The basic aspects of lipoprotein metabolism will be discussed along with fundamentals of the analytical methods employed for each. Cases will be used to highlight the clinical utility of routine and esoteric lipoprotein analysis. Novel cardiovascular biomarkers will be briefly reviewed with emphasis on C reactive protein.

5 – *Therapeutic Drug Monitoring & Toxicology*, by Dr. Cleve

A few "rules of thumb" and basic concepts to help you give more useful answers to therapeutic drug level requests and keep you out of trouble with toxicology.

6 – *Understanding Medical Laboratory Quality*, by Dr. Noble

Modern view of Quality in the medical laboratory still begins with Quality Control but no longer ends there. Today the arena of Quality extends to a full discussion of Quality Assessment, Quality Management, Continual Improvement, Quality Partners, Quality Costs and Quality Culture. It is through our efforts and energy to ensure Quality that we can meet the needs of our patients, our colleagues and our profession.

7 – *Kidney Function Tests, Urinalysis and Urinalysis Case Histories*, by Dr. Pudek

In this session the physiological function of the kidney, common disorders of the kidney and the role of renal function tests in assessing kidney disease will be examined. The components of routine urinalysis will also be reviewed. The laboratory assessment of renal disease will be reviewed using case examples.

8 – *Clinical Enzymology & Biomarkers of Cardiac Injury. Cardiac Markers: Myocardial Infarction, by* Dr. Pudek

The general properties of enzymes and how they are measured will be reviewed. The sources, clinical use and methods of measurement of alkaline phosphatase, lactate dehydrogenase, aspartate transaminase, alanine transaminase, amylase, gamma glutamyl transpeptidase, creatine kinase and lipase will be discussed. Case histories will be utilized to illustrate the application of clinical Enzymology.

In part 2 of this the role of troponin I and T as markers of cardiac injury including myocardial infarction will be reviewed