

# **Mechanisms of Human Disease 2014-2015**

## **Introduction to the Principles of Laboratory Medicine and Laboratory Data Interpretation**

### **Curriculum Goal:**

Laboratory testing in the care of patients is uniformly recognized as a critical component of modern medical care. Laboratory services have a significant role in informing healthcare decisions, as well as healthcare spending.

The goal of MHD “Introduction to the Principles of Laboratory Medicine and Laboratory Data Interpretation” modules is for students to understand the broad principles needed to appropriately use laboratory testing for achieving safe and effective care to patients.

### **Curriculum Objectives:**

List at least 5 reasons why laboratory tests are performed.

Describe the role of the discipline “Clinical Pathology”.

Describe the roles laboratory medical directors and clinical pathologists and how seeking consultation from them helps in patient care.

Describe the 3 phases of the diagnostic testing process Pre-analytic, Analytic and Post-analytic.

Define: point of care testing”.

Describe variables of the pre-analytic phase of laboratory testing and their relevance to the laboratory testing process and ultimately to patient care.

Describe why different color test tubes are available to collect patient samples. Describe how using the wrong color tube may affect the testing process (note: students need not memorize the different color test tubes and their additives but they should understand the concept of why they exist).

Discuss reasons why a patient specimen may be rejected by laboratory staff.

Define “accuracy” and “precision”.

Discuss steps taken by laboratory staff to ensure the quality of the analytic phase of laboratory testing.

Define “critical value” (also known as “critical test result”).

Discuss variables in the post-analytic phase of laboratory testing.

Explain why laboratory test results must be interpreted in light of the patient’s overall condition.

Contrast “normal range” vs “reference range”.

Describe the approach of establishing “normal” ranges for results of a test from a normal healthy population which fall into a Gaussian distribution vs those with non-Gaussian distributions.

Explain why 5% of laboratory test results from healthy individuals might fall outside a reference range.

Contents:

- ✚ Introduction to the Principles of Laboratory Medicine
- ✚ Module 1 – What is Laboratory Medicine
- ✚ Module 2 – The Diagnostic Testing Process
- ✚ Module 3 – Pre-analytic Phase of Laboratory Testing
- ✚ Module 4 – Analytic Phase of Laboratory Testing
- ✚ Module 5 – Post-analytic Phase of Laboratory Testing
- ✚ Module 6 – Establishing Reference Ranges
  
- ✚ Common Laboratory Tests – an optional but recommended module to help students better understand some specifics of individual laboratory tests (i.e. CBC, BMP, CMP)