

July 23, 2020

FOUR REASONS WHY CLINICAL LABS MATTER

1. BACKBONE OF HEALTH CARE INFECTION CONTROL.

- A. In the absence of laboratory testing, containing an infection is like fighting invisible enemies.
 - i. A couple of classic stories in AHI hospitals.
 - 1. *MRSA is unknown in this particular hospital until the laboratory staff were trained to detect it.*
 - 2. *In another hospital a deadly parasite was unknown until it was demonstrated to the staff how to detect it in a sustainable way.*
- B. Safe hospital environment from infectious microorganisms.
 - i. Environmental culture, e.g. operating theater and patients' room.
 - ii. Equipment and water culture.
- C. Detection of carriers of pathogenic bacteria among hospital employees.
 - i. An incident in one AHI hospital where a hospital employee was discovered to be a carrier of MRSA.

2. ASSISTS IN DRUG THERAPEUTIC MONITORING.

- A. Precise antibiotic therapy is the consequence of having a quality microbiology laboratory as oppose to empirical therapy or shotgun antibiotic treatment that triggers the emergence of antibiotic resistance in bacteria.
 - i. A couple of personal experience to discourage trial-and-error therapy.
 - 1. *Wazir Ahkbar Khan Hospital in Kabul Afghanistan.*
 - 2. *Bush hospital in Africa where patients were attracted due to evidence-based antibiotic therapy.*

3. SHARPENS DIAGNOSTIC DECISION MAKING

- A. Doctors' and other health practitioners' diagnostic capabilities and interventions are markedly enhanced with reliable laboratory tests.
 - i. Typical scenario in some hospitals in Africa before AHI laboratory initiative.
 - 1. *Errors due to homemade procedures.*
 - a. *In 13 appendectomy procedures only one is true appendicitis due to homemade white blood cell count procedure.*
 - 2. *Errors from lack of training.*
 - a. *In another health care facility, 90% of the patients were erroneously called malaria positive because of wrong technic and interpretation.*
 - 3. *Errors from lack of proper laboratory equipment.*
 - a. *Again, in another mission hospital, the hemoglobin test is done by Sahli hemoglobinometer – circa 1902 methodology, leading to erroneous diagnosis of anemia in majority of patients.*

4. REASONABLE REMUNERATIVE SOLUTION TOWARDS SUSTAINABILITY.

- A. Good and efficient clinical laboratory sustains and provides a strong financial support to the institution.
 - i. An excellent illustration.
 - 1. *Haiti Adventist Hospital - signature AHI project is a solid evidence especially during this pandemic crisis.*

5. ESSENTIAL ITEMS TO START A SIMPLE CLINICAL LABORATORY.

- A. The cost of a basic clinical laboratory is about \$16K, consisting of the following instruments.
 - i. Semiautomated chemistry machine (Statfax 3300 - \$2700): provides kidney function test, liver function test, lipid panel (cholesterol, triglycerides and HDL), glucose, uric acid, albumin, total protein, Calcium, and cardiac enzymes depending upon the availability of reagents locally.
 - ii. Hematology analyzer with 3 parameters (QBC Plus - \$3000): provides hematocrit, hemoglobin, WBC & RBC counts, MCHC, and platelets.
 - iii. 2 Binocular microscopes (\$2000).
 - iv. 2 Centrifuge (\$800).
 - v. Pipettes (\$500).
 - vi. Glassware (\$500).
 - vii. Chemistry reagents, supply for a year depending on sample volume (\$1000)

- viii. Annual supply of hematology reagents, depending on sample volume (\$1300).
- ix. Microbiology incubator, (\$2000).
- x. Microbiology consumables and culture media for a year supply (\$1400).
- xi. Accessories like inverter-charger-battery for clean power, distilled water maker, (\$500).
- xii. Hematocrit centrifuge (\$300).

B. Initial hands on training is about 4-6 weeks.

- i. Weird test results and hard to identify organisms never encountered before are resolved through WhatsApp social media platform.
- ii. Equipment troubleshooting and repair are done through WhatsApp.

6. QUESTIONS?