

## Clinical Pathology appointment

### Objectives

The students will rotate through haematology, biochemistry, histopathology and microbiology sections of the laboratory and the blood bank.

Duration – 3 weeks

At the end of the appointment the student is expected to

- (1) Achieve the objectives stated under each section.
- (2) Complete tasks in each section and submit a written report.

### General objectives

1. Describe the universal precautions and laboratory safety procedures.
2. List the equipment and material needed in venipuncture
3. Observe and describe the correct procedure of venipuncture
4. List different kinds of specimen collection tubes and the samples collected for each tube
5. State how to correctly label the specimen container
6. State the details to be included in a request form
7. Name the anticoagulants and other chemicals used in collection tubes and their action
8. State the quantity of the samples collected for different tests.
9. Describe the process of specimen handling within the laboratory

### Haematology Laboratory

#### Pre-requisite knowledge

1. Physiology of normal haemopoiesis
2. Response of the erythrocytes, leukocytes, and platelets to pathologic stimuli
3. physiology of coagulation
4. pathological basis of coagulation disorders

Students should be able to

1. Identify the following basic tests performed in the haematology lab
  - Full blood count
  - Blood picture
  - ESR
  - Basic coagulation tests (PT, APTT, BT)
2. List the indications for requesting the tests mentioned in 1
3. Describe the collection methods and errors of the test mentioned in 1
4. Describe how you would prevent the collection errors mentioned in 3
5. To interpret results of the tests mentioned in 1
6. List the equipments used in basic tests mentioned in 1
7. Know the normal reference ranges of the tests mentioned in 1

8. List the indications and interpretation of the following special tests
  - G6 PD screening
  - Reticulocyte count
  - Osmotic fragility test
  - Bone marrow aspiration and trephine biopsy
  - Protein and Haemoglobin Electrophoresis
9. Observe the procedure and equipment used for bone marrow aspiration and trephine biopsy

## **Blood bank**

### **Pre requisite knowledge**

1. Normal composition of blood
2. Normal life span of the components of blood
3. Physiological basis of major and minor blood groups in humans
4. Microbiological organisms transmitted by blood and blood products
5. Immunological basis of antigen antibody reactions

Students should be able to

1. Identify the different sections of the blood bank.
2. List the donor selection criteria.
3. Describe the blood donating procedure.
4. Describe blood screening procedure.
5. Identify blood groups using forward and reverse grouping.
6. Perform blood grouping and cross matching.
7. List the clinical use of blood components.
8. Explain how the blood components are prepared and stored.
9. State the indications for transfusion of the various blood components.
10. List common infectious disease risks of blood product transfusions.
11. List the types of transfusion reactions.
12. Describe the pathophysiology, clinical presentations, identification and management of transfusion reactions.
13. Explain the importance of blood specimen labeling, the process of issuing and administering blood products, including patient safety checks, required infusion times, and appropriate blood product storage limitations once products are issued from the blood bank.
14. Explain the pathological basis of hemolytic disease of the newborn and prenatal compatibility testing.
15. Explain the pathophysiology of Rh immune globulin prophylaxis in preventing hemolytic disease of the newborn.
16. List giving reasons the tests performed in
  - a. investigating a transfusion reaction.
  - b. haemolytic disease of the newborn.

## Biochemistry laboratory

### Pre requisite knowledge

1. Physiological functions of the body
2. Normal constituents of body fluids
3. Pathological basis of the diseases of organ systems

The student should be able to,

1. Identify the following routine tests performed in the biochemistry lab
  - Plasma glucose (RBS, FBS, PPBS, OGTT)
  - Liver function tests
  - Renal function tests
  - Bone profile (calcium, phosphate magnesium, alkaline phosphatase)
  - Serum electrolytes
  - Lipid profile
  - Urine full report
  - CSF full report
2. List the indications for requesting the tests mentioned in 1.
3. Describe the collection methods and errors of the tests mentioned in 1.
4. Describe how you would prevent the collection errors mentioned in 3.
5. To interpret results of the tests mentioned in 1.
6. List the equipments used in basic tests mentioned in 1.
7. Know the normal reference ranges of the tests mentioned in 1.
8. Recognize flags indicated in analyzer reports.
9. Identify investigations performed to assess renal functions and interpret abnormal test results in renal failure and urinary tract infections.
10. Identify investigations performed to assess liver functions and interpret abnormal test results in acute and chronic hepatitis, liver failure, prehepatic, hepatic and post hepatic jaundice.
11. State the tests performed in a CSF sample and interpret the results of abnormal reports to arrive at an aetiological diagnosis.
12. State the tests performed in a seminal fluid sample and know how to interpret the results of abnormal reports.
13. List bedside tests used for patient care (urine heat tests, Benedict tests, urine strip tests/dipstick, urine hcg)
14. Describe the procedure for such bedside testing and their interpretation.
15. List the biochemical investigations that are sent to reference laboratories and state the indications for the tests.

## **Histopathology laboratory**

The student should be able to

1. Identify the types of specimens received in the laboratory for
  - a. Histopathology
  - b. Cytopathology
2. To state the following with regard to each of the specimen types
  - a. Procedures that are employed to obtain the samples
  - b. Type of container used
  - c. Type of transporting medium
  - d. Amount of transport medium to be added
  - e. Proper labeling of specimens
  - f. Details to be included in the accompanying request form
3. Explain the reasons for following the above procedures when collecting and transporting specimens for histopathology and cytopathology.
4. Observe and list the events that occur in the histopathology lab after a specimen is received in the laboratory.
5. Observe and outline the processing of histopathology and cytopathology specimens.
6. List the basic histochemical stains used in histopathology and cytopathology.
7. State rapid diagnostic tests that can be performed in the histopathology laboratory.
8. Explain the difference between cytological diagnosis and histological diagnosis.
9. List the common sites where fine needle aspiration(FNAC) is performed.
10. State the advantages and limitations of FNAC.
11. Describe the aim, procedure and pathological basis of the Papanicolaou test.

## **Microbiology laboratory visit**

After completing the microbiology laboratory visit students should be able to,

1. Explain the basic functions of a microbiology laboratory.
2. Discuss the principles of sample collection, storage, transport to include request from filling and specimen labeling in relation to samples being sent for microbiological investigations to include bacteriology, virology, mycology, serology and molecular biological investigations.
3. Describe the approximate time durations taken to obtain results from commonly requested cultures to include urine, blood, sputum, pus/wound swabs and stool cultures and antibiotic sensitivity testing
4. Discuss the importance of interpretation of common culture reports in relation to infection, colonization and contamination
5. Discuss the role of a microbiology team to include microbiologists, medical officers of microbiology, laboratory technicians and infection control nurses in patient management.
6. Describe the different modes of communication that can be employed to ensure the proper communication of microbiological laboratory results for optimal patient management.