

# **INTERNSHIP REPORT**

Submitted to

**SATHYABAMA INSTITUTE OF SCIENCE AND TECHNOLOGY**

In partial Fulfilment for the Award of The Degree Of

**BACHELOR OF SCIENCE**

In

**MEDICAL LABORATORY TECHNOLOGY**

By

**Ms. SWATHI. M (Reg. No: 41737020)**



**DEPARTMENT OF MEDICAL LABORATORY TECHNOLOGY**

**SCHOOL OF ALLIED HEALTH SCIENCES**

**SATHYABAMA**

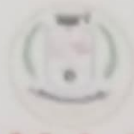
**INSTITUTE OF SCIENCE AND TECHNOLOGY**

(DEEMED TO BE UNIVERSITY)

Accredited with Grade "A++" by NAAC

JEPPIAAR NAGAR, RAJIV GANDHI SALAI, CHENNAI - 600 119

**APRIL 2024**



# SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY

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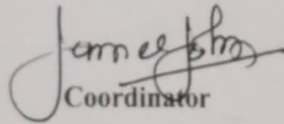
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## DEPARTMENT OF MEDICAL LABORATORY TECHNOLOGY

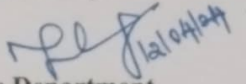
### BONAFIDE CERTIFICATE

This is to certify that this internship report is the bonafide work of Swathi M who have done the project work as a team and carried out the training program at " LION BLOOD BANK RESEARCH FOUNDATION at Ambattur " From 21st Nov to 21th Nov 2022 AND "GERI CARE HOSPITAL at Adambakkam " From 1st Nov to 30th Nov 2023 under our supervision from Aug 2023 to April 2024.



Coordinator

(Dr. James John)



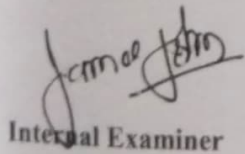
12/04/24

Head of the Department

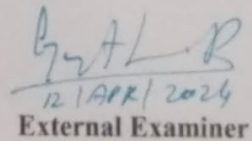
(Dr. J. Premkumar)

Head of the Department  
Department of Medical Laboratory Technology  
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Submitted for Viva vice examination held on 12th April 2024



Internal Examiner



12/04/2024  
External Examiner

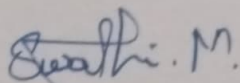
(Dr. GOMATHI R. P.)

## DECLARATION

I MS .SWATHI M (41737020), hereby declare that the internship training done by me at "GERICARE HOSPITAL -T -NAGAR" under the guidance of Dr . JAMESJOHN and "EGMORE LIONS BLOOD BANK AND RESEARCH FOUNDATION – AMBATTUR" under the guidance of Ms. D. JASMINE PRIYA at Sathyabama Institute of Science and Technology is submitted in partial fulfilment of the requirements for the award of Bachelor of science degree in **MEDICAL LABORATORY TECHNOLOGY**.

Date:12.4.2024

Place: CHENNAI

  
( MS.SWATHI M)

## ACKNOWLEDGMENT

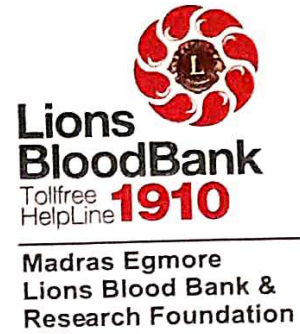
We are pleased to acknowledge our sincere thanks to Board of **Management of SATHYABAMA Institute of Science and Technology** for their kind encouragement in doing this internship program and for completing it successfully. We are grateful to Them.

We would like to express our sincere and deep sense of gratitude to our Head of the Department **Dr. J. Premkumar** and Course Coordinator **Dr. James John** and the for their valuable guidance, suggestions and constant encouragement paved way for the successful completion of our internship report.

We wish to express our thanks to all Teaching and Non-teaching staff members of the Department of Biomedical Engineering who were helpful in many ways for the completion of the internship.

We would like to express our thanks to our parents for their unwavering support to us during these years.

Sharing Life. Saving Lives..since 1984



Date: 12<sup>th</sup> Dec 2022

**TO WHOMSOEVER IT MAY CONCERN**

This is to certify that Ms. Swathi. M, BSc in MLT, 2nd year of Sathyabama Institute of Science and Technology, Chennai - 119, undergone Internship training in Madras Egmore Lions Blood Bank & Research Foundation(Ambattur Unit), Chennai - 58. She has been observed blood bank procedures including Bleeding the Donors, Bloodgrouping, Cross-matching, Component separation, TTI screening and attend Blood donation camp for the period from 21<sup>st</sup> Nov 2022 to 26<sup>th</sup> Nov 2022

During her internship, performance was good and she was able to complete the project on time.

We wish him all the best for her upcoming career.

Ln.J.Madanagopal Rao

Chairman



This project made possible through the co-operation of Lions Club International Foundation. Clubs in the District 324 - A1, A5 & A6 and well wishers - sponsored by Lions Club of Madras Egmore

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Chennai - 600 008. Mob : 9941917505  
Tel : 28414949 / 4959 / 5959  
Web : [www.lionsbloodbank.net](http://www.lionsbloodbank.net)  
AMBATTUR : C-15, A.T.C. Road,  
Ambattur Industrial Estate,  
Chennai - 600 058 Tel : 48504959  
Mob : 99419 17505  
E-mail : [info@lionsbloodbank.net](mailto:info@lionsbloodbank.net)

Ref No: HR/C/57/2023

29-12-2023

**INTERNSHIP COMPLETION LETTER**

This is to certify that Ms. M Swathi a bonafide BSc. Medical Laboratory Technology student of the Sathyabama institute of science and technology Chennai-600119, has successfully completed Internship with the Laboratory Services Department of our hospital.

Duration : 1<sup>st</sup> November 2023 to 30<sup>th</sup> November 2023

**SEMINAR PRESENTED: Spill Management - Hospital Infection Control**

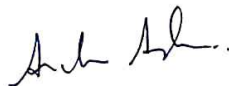
She has learnt to do routine work under supervision and has been aware of basic lab procedures.

She is well behaved and has maintained a cordial professional rapport with lab staff.

We wish her all the best in all her future endeavours.

Best Regards,

For Geri Home Care Services Private Limited,



Dr. Archana Ashwin  
Consultant & Laboratory Head  
Geri Care hospitals  
Chennai



Siddharth B  
Head - HR

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## **ORDER OF DRAW**

1. Blood\_culture bottle (Aerobic & Anarobic)
2. Coagulation study (Citrate )
3. Plain tube (Red)
4. Gel tube (Yellow)
5. Heparin tube (Green)
6. EDTA tube (Purple (or) Lavander)
7. Fluoride tube (Grey)

i

## **TYPES OF TUBES & USES**

### **BLOOD CULTURE BOTTLE:**

It is recommended that each adult routine Blood culture sets include paired aerobic and anaerobic blood culture. The blood drawn should be divided equally between the aerobic and anaerobic bottle. The volume of blood collected in culture bottles is **8-10 ml**.

### **BLUE TUBE OR SODIUM CITRATE TUBE:**

These tubes contain sodium citrate, an anticoagulant that binds calcium ions and prevents blood clotting by inhibiting the coagulation cascade. They are used primarily for coagulation tests, such as prothrombin time (PT), activated partial thromboplastin time (a PTT), and coagulation factor ass

**RED TUBE OR PLAIN TUBE:**

These tubes typically contain no additives and are used for collecting serum samples. Serum is the liquid portion of blood that remains after blood has clotted. These tubes are commonly used for tests such as basic metabolic panels (BMP), liver function tests (LFTs), and lipid panels.

**YELLOW TUBE OR GEL TUBE:**

Gel and Clot Activator Tubes are used to collect blood for clinical biochemistry and immunology. They can improve serum surface and prevent blood substance exchange between blood cell and serum. Clot Activator Tubes are used for separation and examination of blood serum.

**GREEN TUBE OR HEPARIN :**

These tubes contain the anticoagulant heparin or lithium heparin, which inhibits thrombin formation. They are used for tests requiring plasma, such as electrolyte panels, arterial blood gases (ABGs), and ammonia levels.

**PURPLE TUBE OR EDTA:**

These tubes contain the anticoagulant ethylene diamine tetra acetic acid (EDTA), which prevents blood from clotting by binding to calcium ions. They are used for hematology, such as complete blood count (CBC), blood typing, and blood cell morphology examinations.

**GREY TUBE OR SODIUM FLUORIDE TUBE:**

A sodium fluoride, also known as grey – top tube, is used for blood collection to preserve glucose levels by inhibiting glycolysis. It contains an anticoagulant, typically sodium fluoride, to prevent glucose breakdown. These tubes are essential for accurate glucose testing, especially if there is a delay between blood collection and analysis.

## **PHLEBOTOMY**

In phlebotomy, I have seen and learned about blood collection. Phlebotomy is the act of drawing from the circulatory system through a cut ( incision ) or puncture in order to obtain a sample for analysis and diagnosis .

### **Procedure for venipuncture selection**

Palpate and trace the path of veins with the index finger. Arteries pulsate, are most elastic, and have a thick wall. Thrombosed veins lack resilience, feel cord-like, and roll easily. If superficial veins are not readily apparent, you can force blood into the vein by massaging the arm from wrist to elbow, tap the site with index and second finger, apply a warm, damp washcloth to the site for 5 minutes, or lower the extremity over the bedside to allow the veins to fill.

### **Blood collection procedure**

- Patient identification
- Filling out the requisition
- Equipment
- Apply tourniquet and palpate for vein
- Sterilize the site
- Insert needle
- Drawing the specimen
- Releasing the tourniquet
- Applying pressure over the vein
- Applying bandage
- Disposing needle into sharps
- labeling the specimens

## **BLOOD BANK**

### **BLOOD BANK**

A blood bank is a center where blood gathered as a result of blood donation is stored and preserved for later use in blood transfusion. The term "blood bank" typically refers to a department of a hospital usually within a clinical pathology laboratory where the storage of blood product occurs and where pre-transfusion and blood compatibility testing is performed. However, it sometimes refers to a collection center, and some hospitals also perform collection. Blood banking includes tasks related to blood collection, processing, testing, separation, and storage.

#### The components of blood

While blood, or one of its components, may be transferred, each component serves many functions, including the following:

**Red blood cells;** These cells carry oxygen to the tissues in the body and are commonly used in the treatment of anemia.

**Platelets;** They help the blood to clot and are used in the treatment of leukemia and other forms of cancer.

**White blood cells;** These cells help to fight infection, and aid in the immune process.

**Plasma;** The watery, liquid part of the blood in which the red blood cells, white blood cells, and platelets are suspended. Plasma is needed to carry the many parts of the blood through the bloodstream.

Plasma serves many functions, including the following:

**Cryoprecipitate AHF;** The portion of the plasma that contains clotting factors that help to control bleeding.



### Tests are done in blood banking

- Typing: ABO group (blood type)
- Rh typing (positive or negative antigen)
- Screening test
  - Jaundice (Hepatitis B & C)
  - Malaria
  - HIV test
- Venereal disease
- Blood Group



**Before issuing blood;-**

compatibility tests (cross matching) are done.



**DONOR SELECTION CRITERIA**

**Age:** Under the age of 18 to 45

**Hemoglobin :** More than 12.5 g/ Dl.

**Pulse :** Between 50 and 100/ minutes.

**Blood pressure :** systolic 100 -180 mm Hg & Diastolic 50-100 mm Hg.

**Temperatures:** Normal ( 37°C )

**Body weight:** Not less than 45 kg

**Health condition :** The donor should be in a healthy state of mind and body.

## **DONOR REJECTION CRITERIA**

- Affected with HIV virus or AIDS
- If the patient had undergone any open surgery
- When lady is pregnant
- Cancer patient ,kidney patient,
- TB Patient are not eligible
- Low hemoglobin anemic
- When tattoo
- Allergic
- High blood pressure
- Alcoholic
- Smoker
- Organ transplantation

## **BLOOD DONOR COUNSELING**

### **PRE DONATION COUNSELING**

Donors consent for testing of blood for all tests

Provide an opportunity to ask questions and refuse donations.

Risk history assessment

Donation and test information

### **POST DONATION COUNSELING**

Result seeking donors should be given post donation information and counselling

Laboratory tests may indicate presence of TTI

Donors may become very anxious if they are deferred.

## **BLOOD BANK RECORD**

### **TYPES OF RECORD:**

- Technician record
- Donor record
- Reception record
- Sample storage record
- Test record
- Equipment maintenance record
- Transfusion record
- Discarding records

### **STORAGE OF BLOOD COMPONENT**

**Packed red blood cells:** 2-6 degree Celsius up to 42 days

**Fresh frozen plasma:** 30 degree Celsius for up to 2 years

**Platelets:** 20 -24 degree Celsius for 5 days, under constant mixing of the bags platelets aggregation occurs in the cold and in absence of antigen.

## **BLOOD BAGS**

These are the disposable biomedical transparent flexible poly vinyl chloride(PVC) containers, designed to collect, process and store the whole blood and blood components.

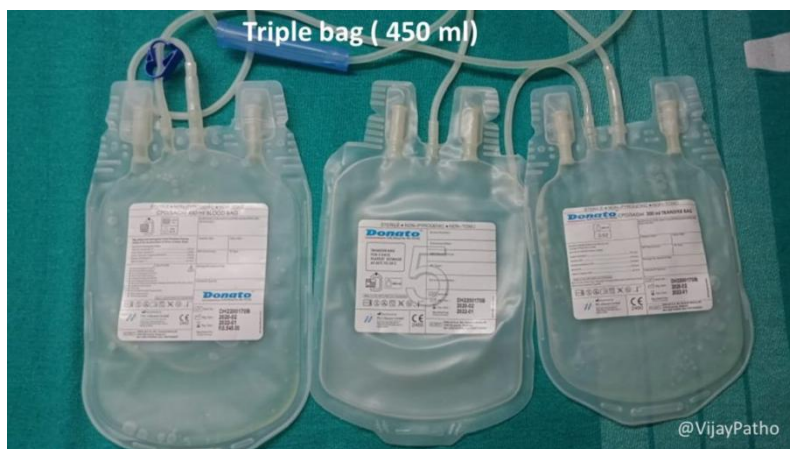
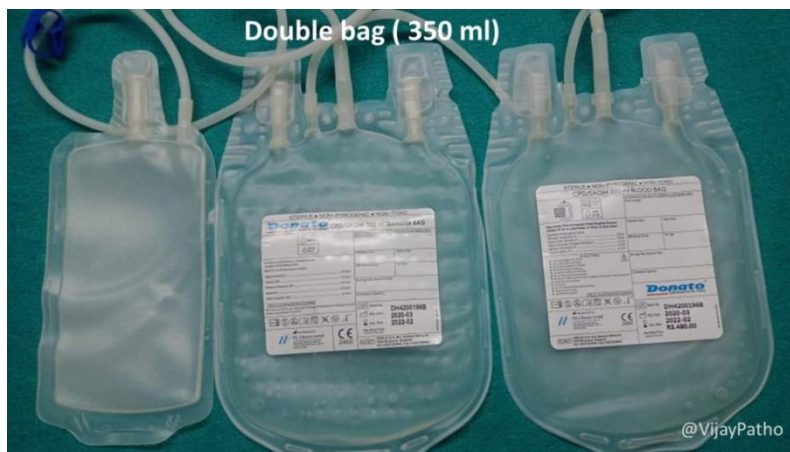
### **The different types of blood bags**

**Single bag:** Used for whole blood collection

**Double bag:** Used to separate packed cells and Plasma

**Triple bag:** Used to separate packed cells, plasma and platelets

**Quadruple bag:** Used to separate packed cells, plasma, platelets and cryoprecipitate



**SAMPLE RECIEVE AREA**

[illegible]

Receiving samples for analysis may be one of the most overlooked areas in a laboratory, but it is an area where errors can occur and this is why we have placed a great deal of importance to it. We receive samples from our own collection centres, other labs, pick-up points at our receival area in SDRL. All samples arriving at SDRL are checked to ensure they were properly collected, identified and correctly transported from sites to SDRL. All the samples are matched against the Test Requisition Forms, duly filled. We digitally document the date and time of the sample receipt. Every sample is visually examined to evaluate the suitability and acceptability of the sample for the requested test. This entails checking.

Transport medium or preservative for the sample

Temperature of the sample upon receipt

Length of time between sample collection and receipt – whether the sample was received within acceptable time limitations

Transport container integrity, i.e. no leaks or cracks.

The quantity of the sample – whether there is sufficient quantity to perform testing If the sample integrity is found to be compromised, then the sample is rejected and the relevant patient/client/doctor is informed and a repeat collection is requested.



## **HEMATOLOGY**

### **HEMATOLOGY**

1. Complete Blood Count (CBC)
2. Erythrocyte sedimentation rate (ESR)
3. Glycated hemoglobin (HbA1C)

### **COAGULATION**

1. Prothrombin Time
2. Activated Partial Thromboplastin Time
3. D-Dimer

### **CBC**

A complete blood count is a common blood test that is often part of a routine checkup. Complete blood counts can help detect a variety of disorders including infections, anemia, diseases of the immune system, and blood cancers .

### **ADVIA 560 Hematology Systems**

The ADVIA 560 Hematology Systems offer laboratories fast, high-quality CBC testing. As part of Siemens Healthineers family of scalable hematology analyzers, the systems have been designed with flexible and intuitive options to enable the right fit in your lab. Compact and cost-efficient, the systems can serve as stand-alone or backup analyzers. With an optional autoloader to automate sampling, the ADVIA 560 AL System can flexibly adapt to the ever-changing laboratory environment.

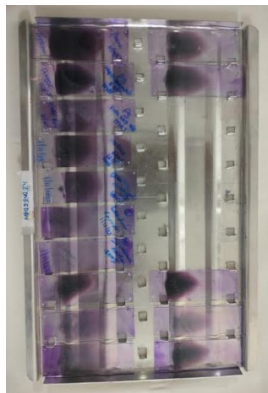


## UNDRE CBC TEST

|                   |                                                                                                         |
|-------------------|---------------------------------------------------------------------------------------------------------|
| Red blood cell    | - <b>Male:</b> 4.3 to 5.9 million /mm <sup>3</sup><br><b>Female:</b> 3.5 to 5.5 million/mm <sup>3</sup> |
| Hemoglobin        | - <b>Male:</b> 13.5 to 17.5 gram/dl<br><b>Female:</b> 12.5 to 15.2 gram/dl                              |
| White blood cells | - 4500 to 11,000/mm <sup>3</sup>                                                                        |
| Platelet count    | - 135 to 370 billion cells/L                                                                            |

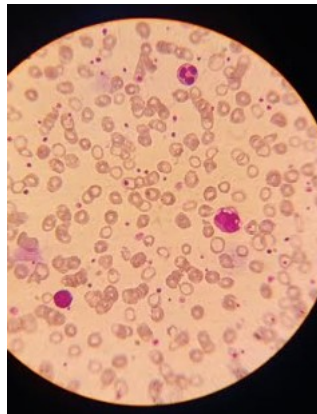
## PERIPHERAL BLOOD SMEAR

A peripheral blood smear (PBS) test is a technique healthcare providers use to examine your red and white blood cells and your platelets under a microscope. Your healthcare provider may order a peripheral blood smear along with a complete blood count (CBC).



### Peripheral smear provides information regarding:-

- Morphology of RBC's (size, shape and appearance) to evaluate anemia
- Differential leukocyte count
- Identification of abnormal cells (immature cells)
- Morphology of platelets and platelet count
- Presence of parasites.



| Morphology of RBC       |  | Associated conditions                                                                                                                                                                                                |
|-------------------------|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Macrocytic RBC          |  | <ul style="list-style-type: none"> <li>Vitamin B12 or folic acid deficiency</li> <li>Liver disease</li> <li>MDS</li> <li>Chronic therapy (methotrexate)</li> </ul>                                                   |
| Microcytic RBC          |  | <ul style="list-style-type: none"> <li>Iron deficiency anemia</li> <li>Thalassemia</li> <li>Parvovirus infection</li> <li>Chronic disease and sideroblastic anemia (rare)</li> <li>Acute myeloid leukemia</li> </ul> |
| Spherocyte              |  | <ul style="list-style-type: none"> <li>Autoimmune hemolytic anemia</li> </ul>                                                                                                                                        |
| Stomatocyte             |  | <ul style="list-style-type: none"> <li>Hereditary stomatocytosis</li> <li>Liver disease</li> </ul>                                                                                                                   |
| Elliptocyte             |  | <ul style="list-style-type: none"> <li>Hereditary elliptocytosis</li> <li>Severe iron deficiency anemia</li> </ul>                                                                                                   |
| Schistocyte             |  | <ul style="list-style-type: none"> <li>Microangiopathic hemolytic anemia</li> <li>Mechanical valve induced</li> </ul>                                                                                                |
| Target cells            |  | <ul style="list-style-type: none"> <li>Thalassemia, hemoglobinopathies</li> <li>Postoperative liver disease</li> <li>Liver disease</li> <li>Splenectomy</li> </ul>                                                   |
| Bite cells              |  | <ul style="list-style-type: none"> <li>G6PD deficiency</li> <li>Immune hemolytic disorders</li> <li>Chilastar drug</li> </ul>                                                                                        |
| Sickle cell             |  | <ul style="list-style-type: none"> <li>Sickle cell anemia</li> <li>Sickle cell disease</li> </ul>                                                                                                                    |
| Tear drop cell          |  | <ul style="list-style-type: none"> <li>Megaloblastic anemia</li> <li>Iron deficiency anemia</li> </ul>                                                                                                               |
| Spur cell (Acanthocyte) |  | <ul style="list-style-type: none"> <li>Acute cholestanemia</li> <li>Liver disease</li> <li>Postoperative liver disease</li> <li>Washed blood group phenotypes</li> </ul>                                             |
| Burr cell (Echinocyte)  |  | <ul style="list-style-type: none"> <li>Uremia</li> <li>Artificially</li> <li>Liver disease</li> </ul>                                                                                                                |
| Hemoglobin C crystals   |  | <ul style="list-style-type: none"> <li>Hemoglobin C disease</li> <li>Hemoglobin SC disease</li> </ul>                                                                                                                |
| Rouleau formation       |  | <ul style="list-style-type: none"> <li>Chronic liver disease</li> <li>Multiple myeloma, Multiple myeloma</li> <li>Chronic inflammatory disease</li> </ul>                                                            |
| RBC agglutination       |  | <ul style="list-style-type: none"> <li>Cold autoimmune hemolytic anemia</li> <li>Paroxysmal cold hemoglobinuria</li> <li>Uptake of cold agglutination</li> <li>Multiple myeloma</li> </ul>                           |

## ESR

ESR is a capillary method . It is a test for the diagnosis of inflammatory diseases.

## PROCEDURE

- Mix the anticoagulated blood thoroughly .
- Fill the wintrobe tube by using Pasteur pipette up to mark 0.
- Place the tube vertically in a stand .
- Note the ESR at the end of 1 hour.

## NORMAL RANGE

**Male:** <50 years old:  $\leq 15$  mm/hr.

**Female:** <50 years old:  $\leq 20$  mm/hr.

## HbA1C

### HbA1c - I Chroma Duo

- Test i-Chroma HbA1c is based on fluorescence immunoassay technology. It uses competition immunodetection method to detect glycated proteins.
- Glycated proteins are formed post-translationally from the slow, nonenzymatic reaction between glucose and amino groups on proteins.
- Function of the concentration of glucose to which the erythrocytes are exposed.
- HbA1c mean glycemia during the preceding 120 days, the average life span of erythrocytes.

### PROCEDURE

- Place a Test Device on a clean, dust-free flat surface.
- Check and insert an ID chip into the instrument.
- Take 100  $\mu$ L of Detection Buffer from the vial,
- Put into the pre-dispensed Hemolysis Buffer tube ,
- Mix well,
- Draw 5  $\mu$ L of Whole Blood and
- Put the hemolysis buffer tube
- Mix well
- Incubate -3 minutes
- Take 25  $\mu$ L put it in the I Chroma card
- Then read the value

**Normal Range: 5.7% to 6.5%**



## **COAGULATION**

### **PROTHROMBIN TIME (PT)**

- Place the cuvette with a steel ball in the holder.
- Add 50 ul of sample
- Select the PT test and select 60 secs as incubation period.
- After 60 secs immediately add 100ul of reagent and click start.
- Note the readings in seconds.

**PT NORMAL RANGE : 12-16 Seconds**

### **ACTIVATED PARTIAL THROMBOPLASTIN TIME ( APTT )**

- Place the cuvette with a steel ball in the holder.
- Add 50 ul of samples.
- Add 50ul of Actin reagent.
- Select the APTT test and select 180 secs as incubation period and press start
- After 180secs immediately add 100 ul of Calcium reagent and click start.
- Note the readings in seconds

**APTT NORMAL RANGE : 26-36 Seconds.**



## D-DIMER TEST : ( QUALITATIVE )

- Add 10 ul of sample containing buffer.
- Mix it well
- Add 75ul on the test card
- Incubate 12 minutes
- Input patient details on the analyzer and
- Start analyze and record the readings
- D-DIMER NORMAL RANGE : < **500 ng/ml.**



## **CLINICAL PATHOLOGY**

### **URINE ANALYSIS**

A urinalysis is a test of your urine. It's used to detect and manage a wide range of disorders, such as urinary tract infections, kidney disease and diabetes. A urinalysis involves checking the appearance, concentration and content of urine .

#### **Urinalysis consists of the following components:**

Macroscopic Examination

Analysis

Microscopic Examination

#### **Macroscopic Examination:-**

##### **COLOR**

**Normal urine** should be a shade of yellow , pale yellow and strew yellow.

**Abnormal urine** can be colorless, dark yellow, orange, pink, red, green, brown, or black.

##### **APPEARANCE**

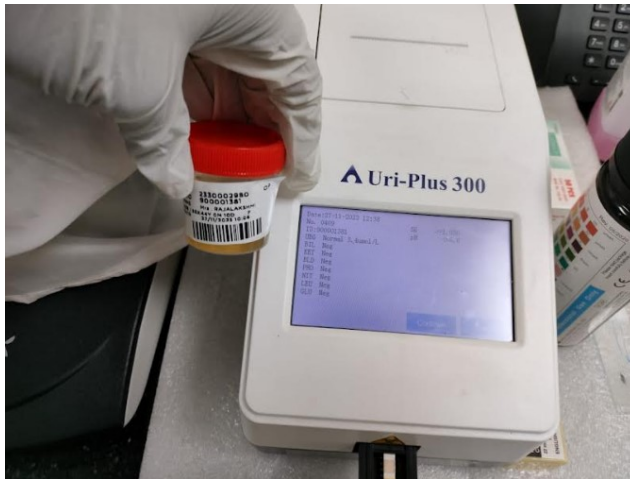
**Normal urine** should be clear.

**Abnormal urine** can be hazy, cloudy, or turbid.



### **Analysis:-**

- ✓ PH – 4.5-8
- ✓ Specific gravity – 1.005-1.025
- ✓ Glucose -  $\leq 130$  mg/d
- ✓ Ketones – None
- ✓ Nitrites – Negative
- ✓ Leukocyte esterase – Negative
- ✓ Bilirubin – Negative
- ✓ Urobilirubin – Small amount (0.5-1 mg/dL)
- ✓ Blood - 3 RBCs
- ✓ Protein - 150 mg/d
- ✓ RBCs - 2 RBCs/hpf
- ✓ WBCs - 2-5 WBCs/hpf



### **Microscopic examination:-**

A variety of normal and abnormal cellular elements may be seen in urine when looked at under a microscope, including:

- ✓ Red blood cells
- ✓ White blood cells
- ✓ Epithelial cells
- ✓ Crystals
- ✓ Bacteria
- ✓ Red blood cells are not found in normal urine.
- ✓ White blood cells and bacteria, signs of infections, are not found in normal urine.

Epithelial cells are found in urine as they are the cells that line the urinary tract

Common crystals seen even in healthy patients include calcium oxalate, triple phosphate crystals and amorphous phosphates. A large number of crystals, or certain types of crystals, may mean kidney stones are present.

## **STOOL EXAMINATION:-**

### **HEMOSPOT KIT METHOD**

#### **PRINCIPLE**

If blood is present in the stool sample, the hematin in the hemoglobin molecule catalyses the release of oxygen from the hydrogen peroxide, which in turn oxidizes the colourless phenolic components of gum guaiac to coloured quinones. During test, after the addition of the developer solution to the reactive surfaces of the result window, the reaction area turns blue if occult blood is present in the sample. If the reaction area does not change colour then, it indicates that there is no occult blood present in the sample.

#### **PROCEDURE**

- ✓ Pierce the nozzle of the developer solution with a rust free sharp pin or needle.
- ✓ Retrieve the required number of test cards to perform the desired number of tests.
- ✓ Label the cards with correct patient identity.
- ✓ Open the sample application windows labelled A and B respectively, to expose the reactive surfaces of the test card. 5.
- ✓ By using the sample applicator provided in the kit spread a very thin layer of stool on the reactive surfaces on the window A similarly on window B from a different part of the stool.
- ✓ Wait until the smeared sample has dried completely.
- ✓ Turn over the test card.
- ✓ Open the result window and add one drop of developer to fields RA and RB (the reverse side of the sample smeared on the sample application windows) respectively..
- ✓ Observe for colour change exactly at two minutes.
- ✓ Even if one of the field's has a blue colour, the test is positive for occult blood.

## INTERPRETATION OF RESULTS

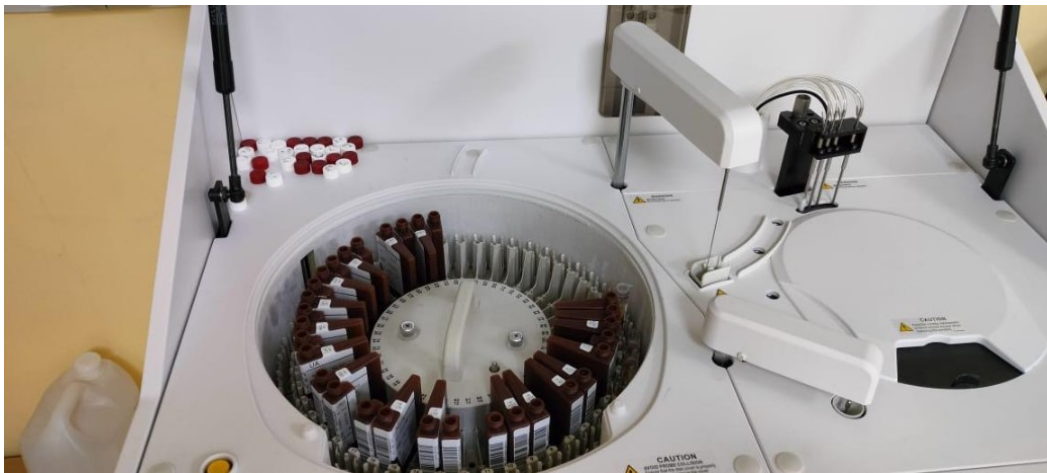
- No blue colour indicates absence of occult blood in the stool.
- Trace blue colouration indicates presence of approximately 5 mg/dl of occult blood in the stool.
- Strong blue colouration indicates significantly more than 5 mg/dl of occult blood in the stool.



## **BIOCHEMISTRY**

### **AUTOPAK 300 ANALYZER:**

This analyzer is mainly used for biochemistry test like,



### **LFT( LIVER FUNCTION TEST ):**

- ✓ Albumin
- ✓ Total protein
- ✓ Albumin / Globulin Ratio ( A/G )
- ✓ Bilirubin – Total , Direct , & Indirect
- ✓ Alkaline phosphates
- ✓ GGT
- ✓ SGOT
- ✓ SGPT

### **LIPID PROFILE :**

- Total cholesterol
- Triglycerides ( LDL & HDL)

### **GLUCOSE PANEL:**

- Glucose tolerance test
- Fasting blood sugar test
- Random blood sugar test
- Post prandial sugar test

### **RFT ( RENEAL FUNCTION TEST ) :**

Urea  
Calcium  
Uric acid  
Blood urea nitrogen  
Creatinine  
Phosphorous  
Blood urea

## ELECTROLYTE ANALYZER:

- Potassium
- Sodium
- Chloride



## **MICROBIOLOGY**

### **Principle of Gram Staining:**

Gram staining is based on the differential retention of crystal violet dye by bacterial cell walls after solvent treatment.

Gram-positive bacteria retain the dye, appearing purple, while gram-negative bacteria lose the dye and are counter stained pink.

### **Reagents Used in Gram Staining:**

- Crystal Violet: Primary stain
- Iodine: Mordant
- Decolorizer: Acetone and alcohol (95%)
- Safranin: Counter stain

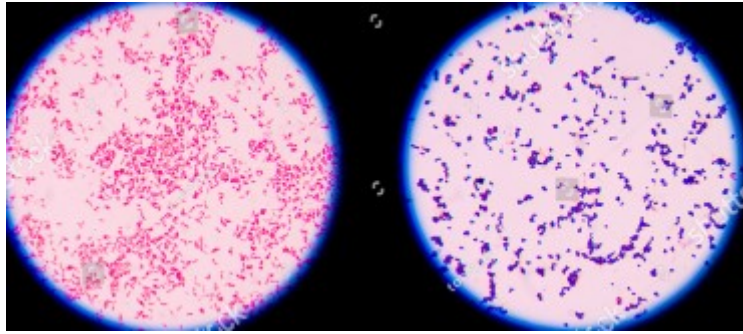
### **Procedure for Gram Staining:**

1. Prepare a clean slide and make a smear of the sample.
2. Air dry and heat fix the smear.
3. Apply crystal violet, then rinse with water.
4. Flood with Gram's iodine, wash with water.
5. Decolorize with alcohol or acetone, rinse.
6. Apply safranin, wash with water.
7. Air dry, blot dry,
8. Observe under a microscope.

### **Interpretation of Gram Staining:**

Gram-positive bacteria appear blue or purple.

Gram-negative bacteria appear pink.



**Bacterial Identification (ID/AST):**



1. Preparation involves labeling two test tubes as ID and AST, adding 3ml saline to each, and mixing a small colony in the ID tube.
2. The mixture is placed in a GN-GP Vitax device and must be within the range of 0.5 to 0.6.
3. For analysis, 145 ul of the ID mixture is added to the AST.
4. Utilizes the Vitak-2 compact Biomerieux analyzer.

## VITEX COMPACT



### MICROBIOLOGY TEST:

- Blood culture
- Urine culture
- Throat culture

#### **Blood culture:**



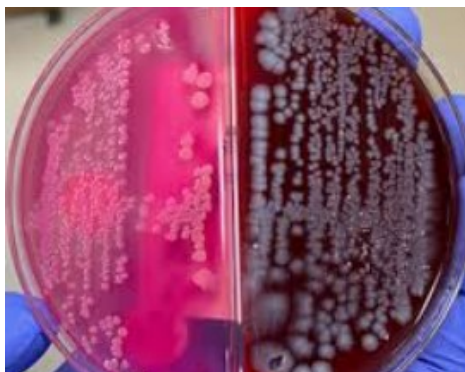
A laboratory test to check for bacteria, yeast, fungi, or other microorganisms in the blood. Blood cultures can help identify the type of microorganism that is causing an infection. This helps determine the best treatment. They may be used to help diagnose septicemia (a serious blood infection) and other conditions.

#### **PROCEDURE :**

- Collect the blood from the patient
- Then received by lab.
- Then keep the sample in Back / Alert 3D Machine.
- And leave it for five days
- Then, if any organisms in the blood , beep sound comes from the machine.
- If it is positive, and we do blood culture and do striking.
- After plateting, Take two tubes mark it as ID and AST.
- In ID tube add saline and add organisms from the striking plate.
- In AST tube add saline and add the mixed ID in AST (145 ML)
- Then place a tube in Vitek \_ compact and the drug card with tube to Identify the Organisms.
- And give the report.

### **URINE CULTURE:**

A laboratory test to check for bacteria, yeast, or other microorganisms in the urine. Urine cultures can help identify the type of microorganism that is causing an infection. This helps determine the best treatment. They may be used to help diagnose urinary tract infections, such as bladder infections. They may also be done after treatment for a urinary tract infection to make sure the microorganism that caused the infection is gone.



**PROCEDURE:**

- Collect the urine from the patient.
- Then received by lab.
- Then do striking plate .
- After 48 hours organisms is grown.
- Then , Take two tubes mark it as ID and AST.
- In ID tube add saline and add organisms from the striking plate.
- In AST tube add saline and add the mixed ID in AST (145 ML)
- Then place a tube in Vitek \_ compact and the drug card with tube to identify the organisms .
- And give the report.

