

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

MR. SANTHOSH .P (Reg. No: 41737028)



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

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APRIL 2024



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DEPARTMENT OF MEDICAL LABORATORY TECHNOLOGY

BONAFIDE CERTIFICATE

This is to certify that this internship report is the Bonafide work of **Santhosh . p** who have done the internship work as a team and carried out the training Internship at “ **Lion Blood Bank Research Foundation at Ambattur and Gericare Hospital at T. nagar** under our supervision from August 2023 to April 2024.


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DECLARATION

I, **Mr Santhosh .P (41737028)**, hereby declare that the internship trainings done by me at **Lion Blood Bank Research Foundation at Ambattur** under the guidance of **Ms. D. Jasmine Priya** and **Gericare Hospital at T.nagar** under the guidance of **Dr. James John** 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: 15/04/2024

Place: Chennai



(**SANTHOSH .P**)

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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.

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I am worked in the GERICARE HOSPITAL – T- NAGAR , laboratory during my internship training period on 1St November to 30Th November from 9 am to 4 pm.

PHLEBOTOMY

In phlebotomy , I have learned and seen about blood collection. Phlebotomy is the process of drawing blood from a patient for medical testing, transfusions, donations, or research. A phlebotomist is a trained healthcare professional who is responsible for collecting blood samples in a safe and sanitary manner.

ORDER OF DRAW

1. No additive tube (culture tube)
2. Sodium citrate tube
3. Plain tube
4. Gel and clot activator or serum separation tube
5. Heparin tube
6. EDTA tube
7. Sodium fluoride tube

TYPES OF TUBES

1. RED TUBE OR PLAIN TUBE : _There is no anticoagulant or additive inside the tube. Because of the contact of blood with the surface of the tube, the coagulation cascade becomes activated. Blood is allowed to clot for 10 to 15 minutes before subjecting to centrifugation to separate the clot from the serum further. Clotting time differs between specimens and may range from 10 minutes to almost an hour (60 minutes).

2. BLUE TUBRE OR SODIUM CITRATE TUBE: The "citrate tube" is for collecting blood for performing coagulation studies. It contains 3.2% sodium citrate as its anticoagulant. Mixing the blood inside the tube a few times is also recommended to form the plasma.

3. BLOOD CULTURE BOTTLE: These colours indicate the colour of the culture bottles necessary for blood culture. These tubes (bottles) contain sodium polyanethole sulfonate (SPS), which serves as an anticoagulant. The primary function of this anticoagulant is to inhibit the activation of complement function. Following the collection of the blood, mixing the bottle 8 to 10 times is needed to mix the contents adequately. The colour of blood culture bottles may vary depending on the manufacturer.

4. **GREEN TUBE OR HEPARIN TUBE:** The green tubes contain heparin (can either be in the form of sodium heparin, lithium heparin, or ammonium heparin), which acts as an anticoagulant by inhibiting thrombin formation. Unlike red tubes, the type of blood produced in a green tube needed for testing is not serum but plasma. Green tubes are frequently used in requesting "stat" or immediate blood chemistry results for emergency cases.

5. **GREY TUBE OR SODIUM FLUORIDE TUBE:** The grey tubes contain potassium oxalate that binds to calcium, thus, inhibiting coagulation. Another substance, sodium fluoride, is also contained in the tubes, which serve as an antiglycolytic agent. That is why it is used for plasma glucose and lactic acid testing.

6. **LAVENDER TUBE OR EDTA TUBE :** The lavender tube is also referred to as EDTA tubes because it uses ethylene-diamine-tetra-acetic acid. The primary role of EDTA in anticoagulation is by chelating calcium ions in the blood to prevent it from coagulation. Since the blood did not clot, the liquid portion (without the red cell) is a plasma. Lavender tubes are commonly used in collecting blood samples for hematologic assays.

PHLEBOTOMY

VENIPUNCTURE:

MATERIAL REQUIRED:

1. Safety Needles, 22g or less
2. Butterfly needles. 21g or less
3. Syringes
4. Vacutainer tube holder
5. Transfer Device 6. Blood Collection Tubes.
 - The vacuum tubes are designed to draw a predetermined volume of blood.
 - Tubes with different additives are used for collecting blood specimens for specific types of tests.
 - The colour of cap is used to identify these additives.
6. Tourniquets. Single use, disposable, latex-free tourniquets

7. Antiseptic. Individually packaged 70% isopropyl alcohol wipes.

8. 2×2 Gauze

9. Sharps Disposal Container. An OSHA acceptable, puncture proof container marked “Biohazardous”.

10. Bandages or tape

VENIPUNCTURE PROCEDURE:

1. Label the tube with the patient’s particular

2. Put tourniquet on the patient about 3-4’ above the venipuncture site

3. Ask patient to form a fist so veins are more prominent

4. After finding the vein, clean the venipuncture site with alcohol using circular motion. Allow the area to dry

5. Assemble needle and vacuum tube holder

6. Insert the collection tube into the holder until the tube reaches the needle

7.. Remove cap from needle

8. Use thumb to draw skin tight about 1-2” below the venipuncture site

9. Hold the skin tight through

10. Insert the needle, bevel side up, into the vein

11. Push the tube completely onto the needle. Blood should begin to flow into the tube until vacuum tourniquet is exhausted

12. Release the tourniquet

13. After opening the patient’s hand, place dry gauge over the venipuncture site and slowly remove the needle

14. Apply mild pressure to the pad

15. Apply bandage or continue applying mild pressure until bleeding has stopped

16. Properly dispose of all contaminates supplies in sharp / biohazard container



Fig : 1.1Blood collection

SAFETY PRECAUTION

- Wear protective latex gloves before starting blood collection and when handling slides for personal protection and to avoid leaving oil on the slide that might interfere with smear preparation. Wear gloves when handling blood, and remove them before leaving the work area or when writing notes.
- Always use a new needle and syringe for each patient.
- Avoid getting blood, wet or dry, on your fingers or hands. • Cover cuts or abrasions on your hands with a waterproof dressing.
- Avoid accidentally pricking yourself when handling sharp instruments that have been in contact with blood.
- Thoroughly wash your hands with soap and water as soon as you finish a job.
- If you get blood on your skin, quickly wipe it off with a cotton swab dampened with alcohol; then wash the affected area with soap and water as soon as possible.

MICROBIOLOGY

In this session I have learn about Gram staining , Acid fast staining, blood culture and urine culture

GRAM STAINING

PRINCIPLE : The bacteria is stained with primary stain Crystal Violet and fixed by the mordant, some of the bacteria are able to retain the primary stain and some are decolorized by alcohol. The cell walls of Gram positive bacteria have a thick layer of protein-sugar complexes called peptidoglycan and lipid content is low. Decolorizing the cell causes this thick cell wall to dehydrate and shrink, which closes the pores in the cell wall and prevents the stain from exiting the cell. So the ethanol cannot remove the Crystal Violet-Iodine complex that is bound to the thick layer of peptidoglycan of gram positive bacteria and appears blue or purple in colour.

REAGENT USED FOR GRAM STAINING:

- Crystal Violet, the primary stain
- Iodine, the mordant
- A decolourizer made of acetone and alcohol (95%)
- Safranin, the counterstain

PROCEDURE OF GRAM STAINING:

- Take a clean, grease free slide.
- Prepare the smear of suspension on the clean slide with a loopful of sample.
- Air dry and heat fix
- Crystal Violet was poured and kept for about 30 seconds to 1 minutes and rinse with water.
- Flood the gram's iodine for 1 minute and wash with water.
- Then, wash with 95% alcohol or acetone for about 10-20 seconds and rinse with water.
- Add safranin for about 1 minute and wash with water.
- Air dry, Blot dry and Observe under Microscope.

INTERPRETATION:

GRAM POSITIVE : PURPLE COLOUR

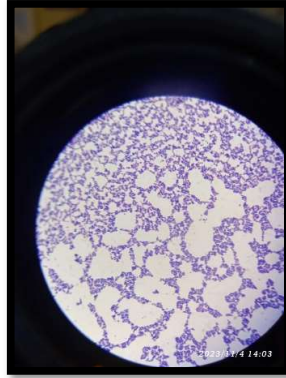


Fig : 2.1 Gram positive

EXAMPLE: *Streptococcus aureus*

GRAM NEGATIVE : PINK COLOUR

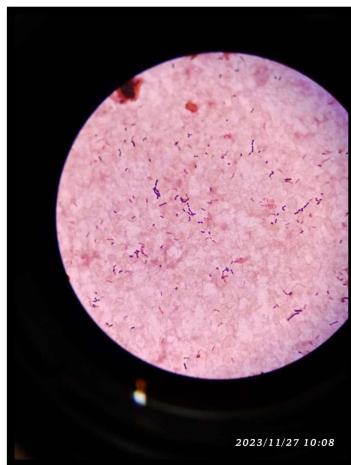


Fig : 2.2 Gram positive

EXAMPLE: *Klebsiella pneumonia*

ACID FAST STAINING

PRINCIPLE :

When the bacterial smear is flooded with carbol fuchsin (primary stain) in presence of heat, the stain penetrates in the bacterial cell wall. Due to which bacteria appears red in colour. Due to the presence of mycolic acid and high lipid content, even after decolorization step, the acid fast bacteria retains the primary stain whereas the non acid fast bacteria gets decolorize. When the smear is flooded with methylene blue (counter stain), the decolorized non acid-fast bacteria takes the counter stain and appears blue in colour. Whereas, the acid fast stain bacterial group cannot taken the counter stain because of the presence carbol fuchsin stain in their cell wall and hence they appear red in colour.

REAGENT USED FOR ACID FAST STAINING:

1. Ziehl- Neelsen Carbol – fuchsin (primary stain).
2. Acid Fast Decolourisation (acid alcohol)
3. Methylene Blue (secondary stain – 0.3%)

PREPARATION OF REAGENT:

1 .CARBOL FUSCHIN:

1. Distilled water _ 100 ml
2. Basic fuchsin – 1g
3. Ethyl alcohol (100 % ethanol) -10 ml
4. Phenol crystals – 5 ml

2. ACID ALCOHOL { 3 %HYDROCHLORIC ACID IN 95% OF ETHL ALCOHOL}

1. Ethyl alcohol – 95 ml
2. Distilled water- 2ml
3. Concentrated hydrochloric acid – 3 ml

3. 0.25% OF METHYLENE BLUE IN 1% ACETIC ACID

- 1.Methylene blue – 0.25 g
2. Distilled water -99 ml

3. Acetic acid -1 ml

PROCEDURE:

- On a clean sterile microscopic slide, make the smear of the sample culture and heat fix the smear over blue heat.
- Over the smear, pour and flood the smear with carbol fuschin and heat gently until it produces fumes.
- Allow it to stand for 5 minutes and wash it off with gently flowing tap water.
- Add 20% sulphuric acid and leave it for 1-2 minutes. Repeat this step until the smear appears pink in colour.
- Wash off the acid with water.
- Flood the smear with methylene blue dye and leave it for 2-3 minutes and wash with water.
- Air dry and examine the stain under the oil immersion lens.

SILDE:



Fig : 2.3 Acid fast stained slide

RESULT AND INTERPRETATION:

Pink colour - **TB POSTIVE**

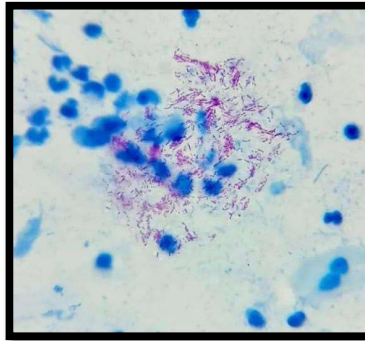


Fig : 2.4 TB positive

Blue colour – **TB NEGATIVE**

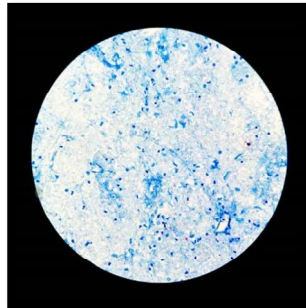


Fig : 2.5 TB negative

BLOOD CULTURE

In microbiology , there are two automated machine. BACT / Alert 3D for blood culture and VITEK 2– compact for ID (Identification) and AST for Antimicrobial susceptibility.

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.



Fig : 2.6 BACT / Alert 3D

VITEK2 – compact



Fig : 2.7_VITEK 2 _compact

BLOOD CULTURE BOTTLES



Fig : 2.8 Blood culture bottle

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 platting, 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 VITEX _ compact and the drug card with tube to identify the organisms

- And give the report.

TYPES OF STREAK PLATE METHOD:

Based on the pattern of streaking, the streak plate method can be classified into 4 types, .Quadrant Streaking

- T-Streaking,
- Continuous Streaking
- Radiant Streaking.

1. QUADRANT STREAKING:

It is the most commonly used and the most preferred method where four equal-sized sections of the agar plate are streaked. It is also referred to as the “four-quadrant streak” or “four sectors” or “four-way streak” method.

In this method, each plate is divided into four equal sectors and each adjacent sector is streaked sequentially. The sector which is streaked first is called the first sector or the first quadrant, and it has the highest concentration of inoculum. Gradually the second, third, and fourth quadrants will have diluted inoculum. By the time the fourth quadrant is streaked, the inoculum is highly diluted giving rise to isolated colonies following the incubation.

2. T- STREAKING

It is another method of streaking where the agar Petri plate is divided into three sections and each section is streaked. Hence, this method is also known as the “three-sector streak” method.

The media is divided into three sections by drawing a letter “T” and each adjacent section is streaked sequentially. By the time the final section is being streaked, the inoculum is diluted to the point to give rise to isolated colonies following the incubation. Mostly discontinuous fashion of streaking is followed; however, a continuous fashion can also be used in the very dilute specimen.

As in quadrant streaking, it is difficult to culture two or more samples in a single 10 cm plate using this method.

3 .CONTINOUS STREAKING :

It is another commonly followed method where an inoculum is evenly distributed in a single continuous movement from starting point to the centre of the plate. There is no need to divide the plate and sterilize the loop during the process. It is easy and quick; however, the problem is that we can use it only if the inoculum is either very diluted or we just have to propagate pure culture rather than isolate one.

We can divide the 10 cm Petri plate into different sections (mostly 2 to 6), and in each section, we can streak different specimens following this method. Hence, it is used in the clinical laboratory to culture urine, sputum, pus, etc. if multiple samples have arrived at a single time. This will allow us to save media and get maximum output using a minimum resource

4. RADIANT STREAKING

It is another method of streaking where the inoculum is first streaked at one edge and spread in vertical lines above the edge. Finally, the vertical lines are cross streaked diagonally. This method is suitable to propagate pure culture, and also in the case of a dilute specimen.

HEMATOLOGY

In hematology , I seen and learn about tests like **ESR, , CBC , PHERIPHERAL SMEAR, BLOOD GROUPING.**

1. ESR(ERTHROCYTE SEDIMENTATION RATE):

PRINCIPLE: Capillary method, The ESR test measures the erythrocyte sedimentation rate, which is how quickly red blood cells settle at the bottom of a blood sample. Doctors cannot use the results of the test to diagnose a specific disease because many different health conditions can cause the ESR to be high or low.

PROCEDURE:

- The ESR test measures the rate at which the red blood cells, or erythrocytes, in a sample of blood settle at the bottom. This process of settling is called sedimentation.
- Take blood from patient and label it and it will transfer the blood to a vertical test tube in which the red blood cells will slowly settle at the bottom. This will leave a clear, yellowish fluid at the top, which is blood plasma.
- The result of the test will depend on the amount of plasma at the top of the tube after 1 hour. The measurement will be in milli meters per hour (mm/hr).

RESULT: The result of the ESR test is the amount of plasma remaining at the top of the test tube after 1 hour.

NORMAL RANGE: 1–13 mm/hr for males and 1–20 mm/hr for females.



Fig : 3.1 ESR

2. CBC (COMPLETE BLOOD COUNT):

PRINCIPLE: Electrical embedded method. A complete blood count (CBC) is a blood test. It's used to look at overall health and find a wide range of conditions, including Anemia, infection and leukemia. And in CBC we measure platelet count, hemoglobin, WBC, RBC, .

NORMAL RANGE:

- **White blood cells:** 4,500 to 11,000 cells per microliter (cells)
- **Red blood cells:** 4.5 million to 5.9 million cells for men; 4.1 million to 5.1 million cells for women
- **Hemoglobin:** 14 to 17.5 grams per deci liter (gm/dL) for men; 12.3 to 15.3 gm/dL for women
- **Hematocrit:** 41.5% to 50.4% for men; 35.9% to 44.6% for women
- **Mean corpuscular volume:** 80 to 96
- **Platelets:** 150,000 to 450,000 platelets



Fig : 3.2 ADVIA 560

BLOOD GROUPING

PRINCIPLE:

- The human blood consists of 4 main components , the red blood cell ,the white blood cell, the plasma, the platelets.
- The red blood cells are the components tat help in determining person's blood type.
- The ABO system is main blood grouping system behind the principle the helps classify people into one of the following four groups,i .e ., A, B, AB, OR O
- Antibodies for the antigens A and B exist naturally in the plasma and these are referred to as they form antigen.
- ABO blood grouping is based on the principle of an agglutination reaction. It is the popular method for blood group identification to determine the presence and absence of cellular antigens and their relative antibodies in the blood



Fig : 3.3 Blood grouping kit

PROCEDURE:

- Label the tile with lead pencil A, B and O circle.
- Place one drop of test serum in each circle.
- Add one drop of corresponding 3% red cell suspension in each circle.
- Mix well with glass rod , gently till and take the tile backward and forward for two minutes.
- And figure out the ABO blood group.
- Figure out the R h blood group.

- Figure out the blood type.

PERIPHERAL SMEAR:

In peripheral smear , if any abnormality in blood we identify in it, platele count, RBC , WBC.

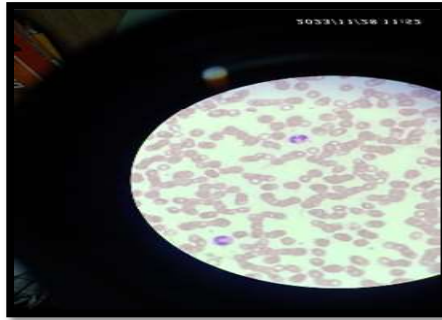


Fig: 3.4 RBC Morphology

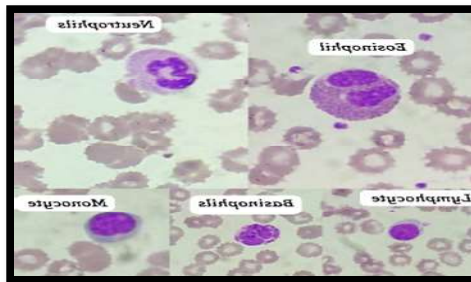


Fig : 3.5 WBC morphology

BIOCHEMISTRY

In this session I have learn and seen about two automated machine.

PRINCIPLE: An essential principle of SFA the introduction of air bubbles . The air bubbles segment each sample into discrete packets and act as a barrier between packets to prevent cross contamination as they travel down the length of the glass tubing.



Fig : 4.1 AUTOPAK 300/300i Analyzer

With an innovative system design and advanced windows-based software, the AUTOPAK 300/300i Analyzer features uninterrupted workflow, enhanced walk away operations and remote access diagnostics, that positions it as one of the market leading system.

FLEXIBILITY: A state-of-the-art benchtop system with removable reagent tray, host query LIMS, remote access capability with diagnostics and intuitive, windows-based software.

PRODUCTIVITY :Continuous sample and reagent loading with on board capacity of 95 samples (5 racks x 19 positions) and up to 72 reagent vials.

TECHINICAL SPECIFICATIONS:

- .Electrical requirements: 600 VA
- Weight: 115 kg
- Dimensions (Width x Depth x Height): 88 cm x 70 cm x 66 cm
- Water Consumption (l/h): 2 litres
- Computer/SW environment: up to Windows 10

- Interferential optical filters: (340-750nm) – 12
- Photometric range (linearity): 0.1/3.6
- Optical resolution: 0.0001 ABS
- Optional direct 4-ISE module
- Internal barcode reader for samples, sectors, and reagents
- Halogen Tungsten lamp life with sleep mode of 2000 hours
- Sample and reagent precision of syringe at full stroke: 0.05% CV

GENERAL CHARACTERISTICS:

- Throughput: Up to 300tests/hour reagent module or up to 480tests/hour with the optional ISE module
- Temperature controlled cuvette tray via air bath: 37 degree Celsius
- Reaction Volume: 180 -650ul.
- Sample volume: 2-2000ul
- Probes/pipettes: 1
- Time to first result: 45 seconds.
- Refrigerated reagents: 8±2°C
- Refrigerated on-board single reagent vials: 72
- Removable and interchangeable reagent tray
- Up to three different reagents per test
- Continuously monitored loading/access of reagents
- Multiple reagent bottles of the same assay/test can be on-board (different lots)
- On-screen inventory management with real time tracking of on-board reagent availability
- Software available in 9 languages

SAMPLE HANDLING:

- Primary, secondary tubes and micro-cups for pediatric samples
- Sample Racks/Positions per rack: 5/19
- Samples on-board capacity: 95
- Continuous loading of sample racks
- Real STAT function
- Automatic sample dilution

- Post-analytical tasks such as re-running and post-dilution can go in next line, for better alignment
- Editable complete A4 patient report
- Unlimited/searchable patient records

1.AUTOPAK 300/300i ANALYZER

LFT (LIVER FUNCTION TEST):

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

LIPID PROFILE:

- Total cholesterol
- Triglycerides

GLUCOSE TEST:

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

RFT (RENAL FUNCTION TEST):

- Urea
- Calcium
- Uric acid
- Blood urea nitrogen

- Creatine
- Phosphorous
- Blood urea

2.LABYTEELECTROLYTEANALYZER:

RFT(RENAL FUNCTION TEST):

- 1.Potassium
2. Sodium
3. Chloride



Fig 4.2 Electrolyte

INTRODUCTION OF BLOOD BANK

BLOODBANKING:

A place where blood is collected from donors, typed, separated, into components, stored, and prepared for transfusion to recipients. A blood bank may be a separate free-standing facility or part of a larger laboratory in a hospital.

FUNCTION OF BLOOD BANKING:

Blood banking, the process of collecting, testing, processing, and storing blood for later use, is a cornerstone of emergency and surgical medicine and is dependent on the clinical laboratory for ensuring the safe use of blood and its components.

This article provides a glimpse into five key aspects of blood banking:

- Recruitment of donors and maintenance of donor's record
- Collection, preservation, and distribution of the blood and blood component
- Teaching, Training and research
- Clinical and therapeutic Function like transfusion and daycare service

DONOR SELECTION CRITERIA:

The donor selection determines the eligibility of a donor to donate blood.

- Weight should not be less than 45 kg
- Age should be between 18 and 65.
- Blood pressure:
 - Systole: 120-180 mm of Hg.
 - Diastole: 60-100 mm of Hg.
- Pulse rate between 50 and 100/minute with no irregularities.
- Hemoglobin level should not be less than 12.5g/dL.
- Pulse rate – between 50 and 100/ minutes with no irregularities.

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 or anemic.
- When tattoo.
- Allergic.
- High blood pressure.
- Alcoholic.
- Smoker.
- Organ transplantation.
- Women should be pregnant or breast feeding her child.
- Women donor should not donate during menstrual cycle.

BLOOD BANK AND ITS TYPES:

Blood containers, are popularly known as blood bag, and are used for the reliable collection, separation, storage and transport of blood. Rounded blood bags design prevents blood coagulation and ensure the blood and anti-coagulants are properly mixed during separation and transfusion.

SINGLE BLOOD BAG:

- This single blood bag system with primary bag contains CPDA-1 anticoagulant solution.
- Used for collection preservation, transfusion, of whole blood
- Packed RBCs are made by removing 200-250ml of plasma from whole blood.
- Available in capacity of 350ml and 450ml.
- 1ml blood weighs **1.06gm**.
- Life span up to 35 days.



Fig : 5.1 Single blood bag

DOUBLE BLOOD BAG:

- For whole blood collection.
- Separation of 2 different blood components (red blood cell and plasma)
- This is obtained through the process of centrifugation and extraction.
- The primary bag contains CPDA-1 anticoagulant solution.
- Life span up to 35 days



Fig : 5.2 Double blood bag

TRIPLE BLOOD BAG:

- Triple Blood Bag with SAGM, for whole blood collection.
- It includes a primary bag and satellite bag
- Separation of 3 different blood components (red blood cells, plasma, and platelets).
- The primary bag contain CPD and one satellite bag contain SAGM.
- Life span up to 42 days.

- Complete a short questionnaire about health history, recent travel, immunizations etc.,

Health Screening:

- Blood pressure, temperature, pulse and haemoglobin is checked

AFTER THE NEEDLE:

Blood draw:

- Clean arm, insert sterile needle, and relax for about 5-8 minutes

Snacks:

- Recharge and hydrate.

BLOOD DONOR COUNSELLING

BLOOD DONOR COUNSELLING:

Blood donor counselling is a confidential dialogue between a blood donor and a trained counsellor about issues related to the donor's health and the donation process; it may be provided before, during and after blood donation. There are benefits for both the BTS and the wider health system in implementing blood donor counselling

- Motivate the donor at high risk to test for HIV
- Help the donor to take the right decision
- Create awareness among the donors on HIV AIDS and TTIs
- Encourage voluntary blood donor to donate regularly
- Donor consent for testing of blood for all tests
- Provide an opportunity to ask question and refuse donations
- Risk history assessment
- Donation and test information
- Getting the reports after the tests

BLOOD GROUPING:

BLOOD GROUPING:

There are 4 main blood groups (types of blood) A, B, AB, O. Your blood group is determined by the genes you inherit from your parents. Each group can be either Rh D positive or Rh D negative, which means in total there are blood groups.

The most important reason to know your blood group types is in case of an emergency. If you are in a situation where you require a blood transfusion, you'll need compatible blood. An incompatible blood group can cause blood cells to clump which can be fatal.

ABO SYSTEM:

ABO blood grouping is based on the principle of an AGGLUTINATION reaction. It is the popular method for blood group identification to determine the presence or absence of cellular antigens and their relative antibodies in the blood. Your blood sample is mixed with antibodies against type A and B. Then the sample is checked to see whether or not the blood cells stick together. If the blood stick together, it means the blood react with one of the antibodies.

Rhesus (Rh) TYPING:

Rh factor is an inherited protein found on the surface of red blood cells. If your blood has the protein, you are Rh positive. If your blood doesn't have the positive, you are Rh negative. The "+" or "-" you might see after your blood type refers to Rh positive or Rh negative. There are five main Rh antigen on RBC ,of which the most important is the **Rh D antigen**. The Rh D antigen is the most immunogenic, meaning that it may provoke an immune response. Another antigen, the Rh antigen similar to one present in Rhesus monkeys (hence Rh), is likewise seen on the outer layer of RBCs of a larger part (almost 80 percent) of people. Such people are called Rh positive (Rh +ve) furthermore, those in whom this antigen is missing are called Rh negative (Rh-ve). An Rh-ve individual, whenever presented with Rh +ve blood, will form specific antibodies against the Rh antigens.



Fig : 5.5 Grouping reagent

The ABO blood typing system groups your blood into one of four categories:

- Type A has the A antigen.
- Type B has the B antigen.
- Type AB has both A and B antigens.
- Type O has neither A nor B antigens.

PROCEDURE

- First mix the patient blood with three different reagents including either the three different antibodies. A B or Rh antibodies.
- Look for agglutination, then you take a look at what has happened.
- Figure out the ABO blood group
- Figure out the Rh blood group
- Figure out the blood type
- Label the two different clean slides with the unique ID of the patient.
- Pipette 50/50 μL (one-one drop) of the blood and deliver it to the first slide in two corners and a drop in the remaining slide at the centre
- Put 1 drop of A, B, and Rh antisera onto each slide respectively, and mix it thoroughly with the help of the clean sticks or using a clean glass slide.
- Tilt the glass slide back and forth for up to 2 minutes.
- Look for the agglutination in each slide.
- In the case of Rh, if agglutination is seen it is reported as Rh positive and if no agglutination is seen, it is reported as Rh negative as shown table of result-interpretation

BLOOD GROUPING TILE

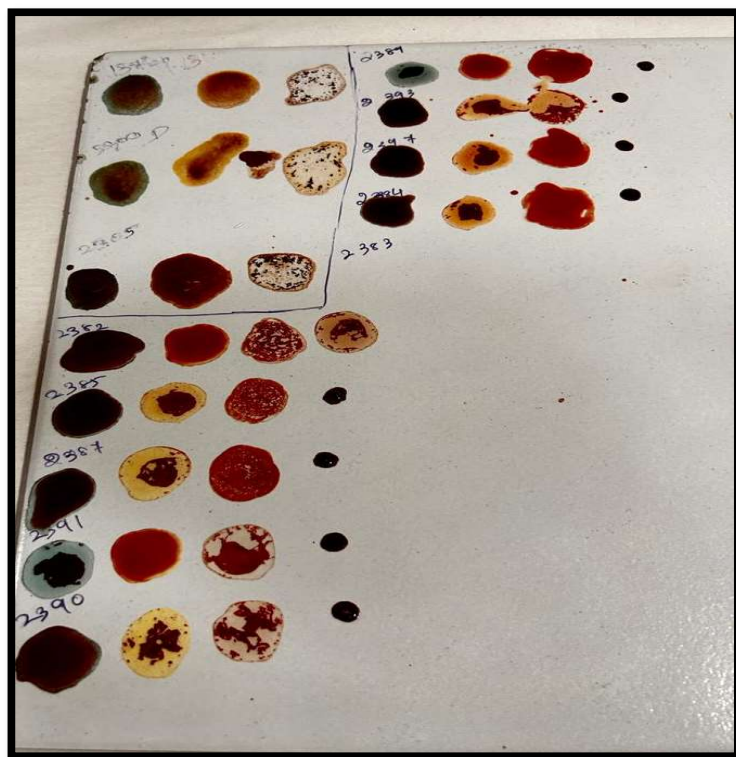


Fig : 5.6 Blood grouping tile

SCREENING TEST

HIV:

An antigen and antibody test performed by a lab on blood from a vein can usually detect HIV 18 to 45 days after exposure. There is also a rapid antigen and antibody test available test is done with a finger stick. Antigen and antibody test means you are protected against the hepatitis B virus .Blood test can be detect signs of the hepatitis B virus in your body and tell your provider whether it acute or chronic A simple blood test can also determine If your immune to the condition Liver ultrasound.



Fig : 5.7 HIV CARD

HCV:

A blood test called an HCV antibody test is used to find out if someone has ever been infected with the hepatitis C virus. The HCV antibody test, sometimes called the anti- HCV test, looks for antibodies to the hepatitis C virus in blood



Fig : 5.8 HCV CARD

HPD:

This histrionic personality disorder (HPD) Test is deigned to see if you might have the symptoms of histrionic personality disorder. About 3% of adult will have histrionic personality disorder in their lifetime



Fig : 5.9 HPD CARD

MALARIA:

Ensure specimen and test kits are brought to room temperature before testing open the foil wrapped pouch and remove the cassette.

COMPONENTS SEPARATION

BLOOD COMPONENT:

- Whole blood
- Platelets
- Plasma
- Cryoprecipitate
- Packed red blood cell

PACKED RED BLOOD CELL:

- Packed red blood cell from a donation of 450 ml of whole blood are obtained after centrifugation and plasma removal
- The red cells are then suspended in a nutritive solution.



Fig : 6.0 packed red blood cell

FRESH FROZEN PLASMA:

- Fresh frozen plasma is obtained after centrifugation of whole blood and red cell removal, or through direct separation
- Because plasma can be stored for a long time, plasma is quarantine until donor comes back for a new donation so that he can be tested again for the infection disease markers.
- This gives optimal security because infections undetectable at the moment of donation.



Fig : 6.1 Fresh frozen plasma

PLATELETS:

- Platelets are mainly obtained through thrombapheresis. Platelets product formerly obtained from a mix of more than 10 buffy coats can now be obtained from a single thrombapheresis of about 40 minutes.



Fig : 6.2 Platelets

CROSS MATCHING

CROSS MATCHING:

Cross matching is a procedure performed prior to transfusion of blood or blood products to detect any serological incompatibilities in the blood of donor and recipient. Before a donor's blood is transfused into a recipient, there should be no antigens or antibodies in both, that would react with each other resulting in transfusion reaction. Cross matching is designed to prevent such transfusion reactions which may occur after transfusion.

- Cross matching plays important role to detect:
- Most recipient antibodies directed against donor's red blood cell antigen
- Most donor antibodies directed against recipient's red blood cell antigens.
- Major errors in ABO grouping, labelling and identification of donor and recipients.

PRINCIPLE:

Cross-matching will detect incompatibilities between the donor and recipient that will not be evident on blood typing. There are two types of cross-matches: Major cross-match and Minor cross-match.

PROCEDURE:

- Cross matching while tube 2 will be the auto control. Tube receives all the treatments of tube 1, except that it does not contain donor's cells.

- Add 2 drops of patient's serum in both the tubes.
- Add 1 drop of 5% saline suspension of donor's cells in tube 1 and 1 drop of patient's cell suspension(5% in saline) in tube 2.
- Mix and centrifuge at 1500 rpm for 1 minute.
- Gently dislodge the cell bottom and examine for agglutination and heterolysis. Record the results. If agglutination is noted in tube 1, ABO incompatibility is suspected.
- Incubate both tubes at 37°C for 15 minutes then add a drop of 22% albumin along the side of each tube. Mix and re-incubate for another 20 to 30 minutes.
- Centrifuge at 1500 rpm for 1 minute. Examine for agglutination and haemolysis. Record the results of agglutination with grading.
- Wash the cells 3 to 4 times with saline, decant completely after each wash and add 2 drops of antihuman globulin serum to the sediment cells. Shake the tubes to mix the contents and then centrifuge at 1500 rpm for 1 minute.
- Examine for agglutination and grade the agglutination reaction. Also look for haemolysis. Some of the antibodies bind with the complement and bring haemolysis which should be considered as an evidence of immunologic reaction (positive).
- If there is no agglutination reaction (negative), add a drop of already sensitized cells. The sensitized or check cells must agglutinate, if the cells are adequately washed and AHG is reactive.



Fig : 6.3 Cross matching kit

INTERPRETATION AND RESULT

Compatible donor and recipient blood should show no agglutination in both major and minor cross match. Blood which shows incompatibility in major cross should never be transfused, because the large plasma volume of the recipient blood containing antibodies can destroy the donor's red cells easily. The minor incompatibility is less important because the donor serum which contains the antibodies is diluted in the recipient town plasma, making the antibodies very dilute and ineffective.

BLOOD ISSUE

BLOOD GROUPING:

There are 4 main groups – A,B, AB, and O . Your blood group is determined by the genes you inherits from the parents

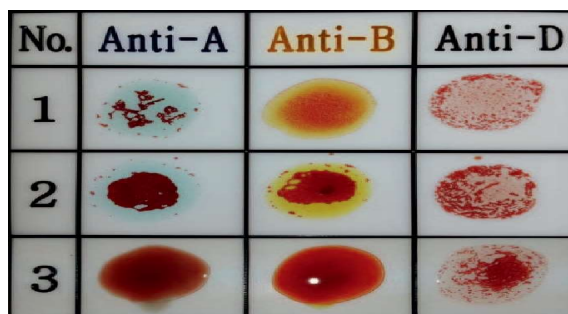


Fig : 6.4 Blood grouping tile

CROSS MATCHING:

Cross matching is performed prior to administration of blood or blood products (e.g) packed red blood cells. The purpose of the cross match is to detect the presence of the antibodies in the recipient against the red blood cell of donor. These antibodies attach to the red blood cell of the donor after transfusion.

- Verify patient' name and medical record number
- Verify patient's ABO and Rh
- Verify donor unit number and ABO and Rh
- Verify cross match compatible portion of the blood product tag
- Check the unit for any unusual colour or appearance

Madras Egmore Lions Blood Bank And Research Foundation (Ambattur Unit)
 C-15, A.T.C Road, Ambattur Ind Estate, Ch-58
 Phone : 044-48504959
 Phone 2: |Fax No.:
 e mail :
 Licence no. : 497/28C

ISO 9001:2008
 Certified
 Organization

Issue Certificate

Name : Mahalakshmi Multispeciality Hospital
 Name : Mr.Bala Krishnan
 Patient's Blood Group : B POS
 Gender : Male Age: 76 Years
 Ip No. :

Cross Match No.: 01074/22-23
 Request No. : 01161/22-23
 Issue Date : 29 Nov 2022
 Time : 11:31

Sl No	Unit No.	Component	BG & Rh	Segment No.	D.O.C	D.O.E	Compatability
1	AD2101472	PRBC	B POS	211 12080 ✓	24-Nov-2022	05 Jan 2023	Yes

☐ The units has/have been selected after cross-matching against the sample provided.
☒ The units is/are group-compatible with the patient's sample provided.

All the units have been screened NEGATIVE for HbsAg,HCV,HIV 1 & 2,Syphilis,MP & Irregular Antibodies Screening

Lab Technician
 Print Date : 29 Nov 2022 Print Time : 11:31
 Note: For any assistance/suggestions : Mail us at info@lionsbloodbank.net or call 28414949/4959 between 09.00 a.m to 5.00 p.m.

Medical Officer

Page 1 of 1

Fig : 6.5 issue certificate

BLOOD BANKING RECORD

RECORD:

- Systematic procedure by which the records of an organization are created, captured, maintained and disposed off.
- Records involve every aspect of blood banking i.e., donor recruitment donor selection, donor recall, blood collection, blood components, screening of blood for.

TYPES OF RECORDS

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

TECHNICIAN RECORD:

- Attendance
- Count .No
- Address
- In time & Out time
- Personal information
- Name
- DOB
- In time & out time
- Age

DONOR RECORD:

- Donor Details
- Name
- M/F
- Age
- Weight/Height
- Blood grouping
- Blood donation date (volume)
- Use
- Donor identification

RECEPIENT RECORD:

- Name
- M/F, Age
- In patient or out patient
- Recipient date
- Whole blood, RBC, Plasma, platelets

SAMPLE STORAGE RECORD

- Blood donation date
- Temperature & self life

TYPE OF SAMPLE

- Whole blood
- RBC
- Plasma
- platelets

DISCARDING RECORD

- Date of collection
- Discarding date
- Discarding technician (name &sign)

PURPOSE OF RECORD:

- To create statistic
- To retain blood donors
- To maintain panel donors
- To recognize & to give awards.
- To undertaken any research activity
- To help during emergency
- To protect the interest of the patients

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Sharing Life. Saving Lives..since 1984



**Madras Egmore
Lions Blood Bank &
Research Foundation**

Date: 12th Dec 2022

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Mr. Santhosh. P, 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. He 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 28th Nov 2022 to 3rd Dec 2022.

During his internship, performance was good and he was able to complete the project on time.

We wish him all the best for his 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
AMBATTUR : C-15, A.T.C. Road,
Ambattur Industrial Estate,
Chennai - 600 058. Tel : 48504959
Mob : 99419 17505
E-mail : info@lionsbloodbank.net

Ref No: HR/C/56/2023

29-12-2023

INTERNSHIP COMPLETION LETTER

This is to certify that Mr P Santhosh 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 : 1st November 2023 to 30th November 2023

**SEMINAR PRESENTED: 1. Needle Stick Injury - Hospital Infection Control
2. Peripheral Smear study - Hematology**

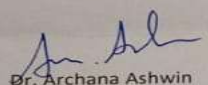
He has learnt to do routine work under supervision and has been aware of basic lab procedures.

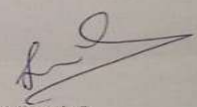
He is well behaved and has maintained a cordial professional rapport with lab staff.

We wish him all the best in all his 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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CONCLUSION :

Overall, the internship was really a great experience. I'd recommend to my fellow juniors. The place is really good for developing skills. I gained experience. And technician knowledge