

# **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 SOWMIYA S (Reg. No: 41737016)**



**DEPARTMENT OF MEDICAL LABORATORY TECHNOLOGY**

**SCHOOL OF ALLIED HEALTH SCIENCES**

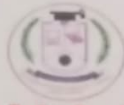
## **SATHYABAMA**

**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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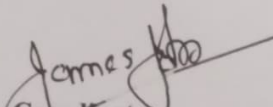
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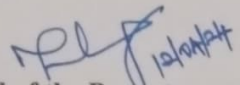
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## DEPARTMENT OF MEDICAL LABORATORY TECHNOLOGY

### BONAFIDE CERTIFICATE

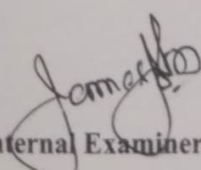
This is to certify that this internship report is the bonafide work of SOWMIYA.S who have done the Internship work as a team and carried out the training program at "CHENGALPATTU MEDICAL COLLEGE, CHENGALPATTU", "EGMORE LIONS BLOOD BANK AND RESEARCH FOUNDATION, EGMORE" under our supervision from August 2023 to April 2024.

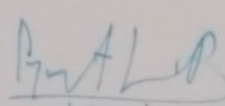
  
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Submitted for Viva voce examination held on 12<sup>th</sup> April 2024

  
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## DECLARATION

I, SOWMIYA. S (41737016), hereby declare that the internship trainings done by me at LIONS BLOOD BANK AND RESEARCH FOUNDATION at EGMORE under the guidance of Ms. D. JASMINE PRIYA and "CHENGALPATTU MEDICAL COLLEGE" 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 :- 12/4/2024

Place :- CHEENAI

S. SOWMIYA  
(S. SOWMIYA)

## ACKNOWLEDGEMENT

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.

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## INTRODUCTION

I SOWMIYA.S undertook internship at CHENGALPATTU MEDICAL COLLEGE - CHENGALPATTU DISTRICT, as a part of my academics during the period of 01st November 2023 to 30th November 2023 (30days) from 10am to 4pm.

### 1. HISTOPATHOLOGY

Histopathology is the branch of medicine that involves the examination of tissues, organs, and cells under a microscope to study the changes associated with disease. It helps in diagnosing diseases, determining the extent of disease progression, and guiding treatment decisions.

### SPECIMEN ACCESSIONING

Specimen accessioning is the process of receiving, documenting, and labelling medical specimens, such as tissue samples, blood samples, or other bodily fluids, in a laboratory setting. This process involves assigning a unique identifier to each specimen, recording relevant patient information, and ensuring proper handling and storage to maintain sample integrity. Accurate accessioning is crucial for tracking specimens throughout the laboratory workflow and ensuring accurate test results.

medical laboratory, specimen accessioning is a critical step in the testing process. It involves receiving patient samples, such as blood, urine, tissue, or other bodily fluids, and properly documenting their arrival. This process typically includes:

**Receipt of Specimens:** Upon arrival at the laboratory, specimens are received from various sources such as hospitals, clinics, or healthcare providers.

**Documentation:** Relevant information about the patient and the specimen, such as patient name, identification number, date and time of collection, and type of specimen, is recorded accurately.

**Labeling:** Each specimen container is labeled with a unique identifier, often a barcode, to track it throughout the testing process.

**Verification:** The received specimens are cross-checked with accompanying paperwork to ensure accuracy and completeness of information.

**Proper Handling:** Specimens are handled according to standard protocols to maintain their integrity and prevent contamination.

**Storage:** Depending on the type of specimen and testing requirements



**Fig 1. Specimen accessioning**

## GROSS EXAMINATION

physical inspection of specimens before they undergo further testing or processing. This examination is typically performed by laboratory technicians or pathologists and involves:

1. **Visual Inspection:** Observing the external appearance of the specimen, including its color, size, shape, and any visible abnormalities or lesions.
2. **Measurement:** Recording measurements such as dimensions, weight, and volume of the specimen, if applicable.
3. **Description:** Documenting the characteristics of the specimen, including any notable features, such as presence of tumors, inflammation, or abnormal growths.
4. **Dissection:** If necessary, the specimen may be dissected or sectioned to examine its internal structures and identify specific areas of interest.
5. **Photography:** Taking photographs of the specimen to document its appearance and aid in further analysis or consultation.

Gross examination provides valuable preliminary information about the specimen, which guides subsequent diagnostic tests and procedures, such as histopathological analysis, microbiological cultures, or molecular testing. It plays a crucial role in the accurate diagnosis and management of diseases



**Fig 2. Grossing**

## TISSUE FIXATION

Tissue fixation is a crucial step in the histopathological processing of tissue samples in a medical laboratory. It involves preserving the structure and cellular components of the tissue by preventing decay and maintaining their integrity for microscopic examination. The main goals of tissue fixation are to:

**Prevent Autolysis and Putrefaction:** Fixation halts cellular and enzymatic activities that would lead to tissue decomposition, preserving the tissue's morphology and cellular architecture.

**Maintain Cellular Structures:** Fixation helps to retain cellular structures, including organelles and cellular membranes, which are essential for accurate histological interpretation.

**Enable Staining:** Fixed tissues are suitable for various staining techniques used in histology, such as hematoxylin and eosin staining, which provide contrast and highlight specific cellular components.

**Facilitate Long-Term Storage:** Properly fixed tissues can be stored for extended periods without significant deterioration, allowing for future reference, consultation, and research.

Common fixatives used in medical laboratories include formalin (formaldehyde solution), alcohol-based fixatives (e.g., ethanol), and other chemical solutions. The choice of fixative depends on factors such as the type of tissue, intended downstream analyses, and preservation requirements.

After fixation, tissues are typically processed further through steps such as dehydration, embedding, sectioning, staining, and mounting onto slides for microscopic examination by pathologists or laboratory technicians. Tissue fixation is a critical component of histopathological analysis, providing essential information for diagnosing diseases and guiding patient care.



**Fig 3. Tissue fixation**

## TISSUE PROCESSING

Tissue processing in a medical laboratory refers to a series of steps performed on tissue specimens after they have been fixed. These steps are designed to prepare the tissue for microscopic examination and analysis by pathologists. The tissue processing workflow typically includes the following stages:

**Dehydration:** The fixed tissue is dehydrated by gradually replacing water with alcohol or another organic solvent. Dehydration removes water from the tissue, allowing it to be infiltrated with embedding medium.

**Clearing:** Following dehydration, the tissue is cleared using a substance such as xylene or other clearing agents. Clearing removes the alcohol or solvent and makes the tissue transparent, facilitating embedding and sectioning.

**Infiltration and Embedding:** The tissue is infiltrated with a molten embedding medium, such as paraffin wax, which impregnates the tissue and provides support for sectioning. The tissue is then embedded in a mold filled with embedding medium and allowed to solidify.

**Sectioning:** The embedded tissue block is trimmed and cut into thin slices (sections) using a microtome. The sections are typically 4-5 micrometers thick and are mounted onto glass slides for further processing.

**Staining:** Tissue sections are stained using various histological stains to highlight specific structures and cellular components. Common stains include hematoxylin and eosin (H&E), which provide contrast between nuclei (blue) and cytoplasm (pink).



**Fig 4. Tissue processing**

**Cover Slipping:** After staining, the tissue sections are dehydrated, cleared, and mounted with a coverslip using a mounting medium. Cover slipping protects the tissue and preserves the staining for microscopic examination.

**Microscopic Examination:** The prepared slides are examined under a microscope by pathologists or laboratory technicians. Microscopic examination allows for the identification of cellular abnormalities, tissue structures, and pathological changes indicative of disease.

Tissue processing is a critical step in histopathology, enabling the accurate diagnosis of diseases and guiding patient management and treatment decisions. Each stage of tissue processing must be performed meticulously to ensure the quality and integrity of the tissue specimens and the accuracy of the diagnostic results.

## **TISSUE EMBEDDING**

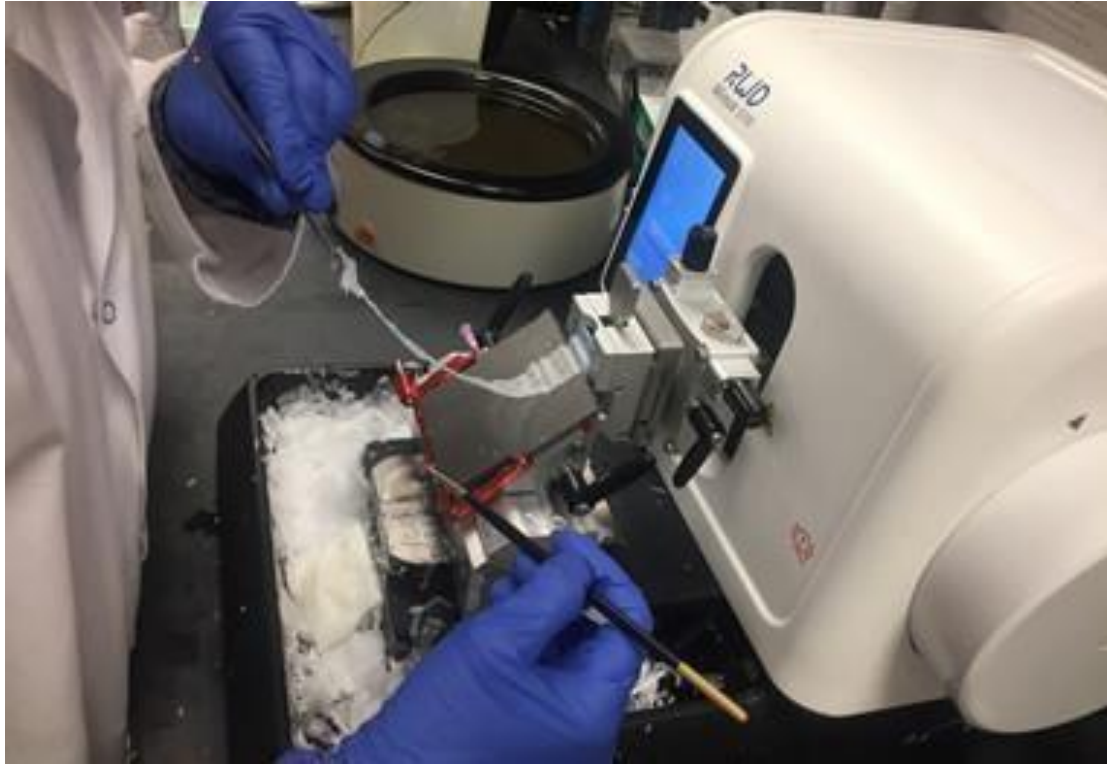
Tissue embedding in a medical laboratory is a crucial step in histology, where tissue samples are embedded in a solid medium, typically paraffin wax, to provide structural support for thin sectioning. This process preserves tissue integrity, allowing for accurate microscopic examination and diagnosis of various diseases.



**Fig 5. Tissue embedding**

## TISSUE SECTIONING

Tissue sectioning in a medical laboratory involves cutting thin slices of embedded tissue samples using a microtome. These thin sections are then mounted on slides for further processing, staining, and microscopic examination. This process allows pathologists to study the cellular structure and morphology of tissues to make accurate diagnoses and treatment decisions.



**Fig 6. Tissue sectioning**

## SLIDE STAINING

Slide staining in a medical laboratory is a crucial step in the histological examination of tissue samples. It involves applying various dyes or stains to tissue sections mounted on slides to enhance contrast and reveal specific cellular structures or components under a microscope. This process plays a vital role in aiding pathologists and researchers in diagnosing diseases, understanding tissue morphology, and conducting research.

The staining process typically involves several steps:

**Fixation:** Before staining, tissue samples must be fixed to preserve their structure and prevent decay. This is usually done using formalin or other fixatives to cross-link proteins and prevent degradation.

**Embedding:** Tissue samples are embedded in a solid medium, such as paraffin wax, to provide support for sectioning and ensure uniform thickness of the sections.

**Sectioning:** Thin slices of the embedded tissue are cut using a microtome and mounted onto glass slides. These sections are often very thin, typically around 5-10 micrometers in thickness.

**Deparaffinization and hydration:** Since the tissue sections are embedded in wax, they need to be deparaffinized and rehydrated before staining. This involves immersing the slides in a series of solvents, such as xylene and alcohol, to remove the wax and restore tissue hydration.

**Staining:** Various staining techniques are used to highlight different cellular structures or components. Common staining methods include:

**Hematoxylin and eosin (H&E) staining:** Hematoxylin stains nuclei blue-purple, while eosin stains cytoplasm and extracellular matrix pink. This staining is widely used in routine histology to visualize overall tissue architecture.

**Special stains:** These stains target specific cellular components or structures, such as connective tissue, muscle fibers, or microorganisms. Examples include periodic acid-Schiff

(PAS) stain for glycogen, Masson's trichrome stain for collagen, and Gram stain for bacteria.



**Fig 7. Slide staining**

## 2.MICROBIOLOGY

### MEDIA PREPARATION

#### 1. CHOCOLATE AGAR

Preparing chocolate agar, also known as heated blood agar, is a common medium used in microbiology, particularly for the cultivation of fastidious bacteria such as *Haemophilus influenzae* and *Neisseria* species. Here's a general guide to preparing chocolate agar:

**Ingredients:** Gather the necessary ingredients, including peptones, beef extract, agar, and defibrinated blood (usually sheep blood). Some variations may include additional nutrients or supplements depending on the specific requirements of the microorganisms being cultured.

**Preparation of Base Medium:** Prepare a nutrient agar base medium by dissolving peptones, beef extract, and agar in water according to specified concentrations. Heat and stir the mixture until the agar is completely dissolved.

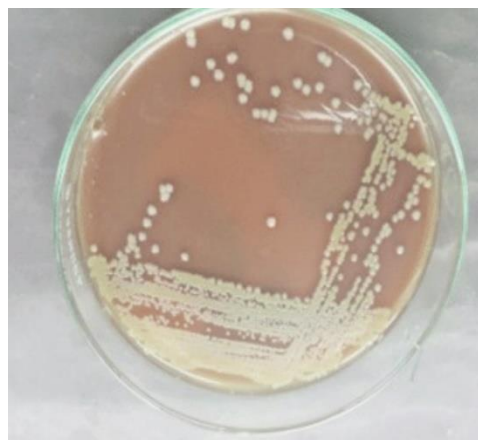
**Adding Blood:** Once the base medium has cooled to around 45-50°C (113-122°F), aseptically add the sterile defibrinated blood to the medium. The blood is typically added at a concentration of around 5-10% (v/v). Mix the blood and agar medium thoroughly but gently to ensure even distribution.

**Heating (Chocolate Treatment):** Unlike regular blood agar, chocolate agar requires an additional step called the "chocolate treatment." This involves heating the blood agar mixture to 80-95°C (176-203°F) in a water bath or incubator for approximately 15-20 minutes. This heating step lyses red blood cells and releases the growth factors required by fastidious organisms.

**Dispensing and Sterilization:** Dispense the chocolate agar mixture into petri dishes or tubes. Properly label each container. Autoclave the filled containers to sterilize the medium, following standard autoclaving procedures.

**Solidification and Storage:** Allow the chocolate agar plates to cool and solidify in a horizontal position to ensure an even surface. Store the plates inverted (lid side down) to prevent condensation from accumulating on the agar surface. Store the plates at appropriate temperatures, usually between 2-8°C (36-46°F) for short-term storage and -20°C (-4°F) for long-term storage.

Chocolate agar provides a rich growth medium that supports the growth of a wide range of bacteria, particularly those with complex nutritional requirements or that are sensitive to environmental factors.



**Fig .8 Chocolate agar**

## 2. BLOOD AGAR

Preparing blood agar, a commonly used medium in microbiology for the cultivation and identification of bacteria, involves the following steps:

**Ingredients:** Gather the necessary ingredients, including peptones, beef extract, agar, and sterile blood (usually sheep, horse, or rabbit blood). Some variations may include additional nutrients or supplements depending on the specific requirements of the microorganisms being cultured.

**Preparation of Base Medium:** Prepare a nutrient agar base medium by dissolving peptones, beef extract, and agar in water according to specified concentrations. Heat and stir the mixture until the agar is completely dissolved.

**Adding Blood:** Once the base medium has cooled to around 45-50°C (113-122°F), aseptically add the sterile blood to the medium. The blood is typically added at a concentration of around 5-10% (v/v). Mix the blood and agar medium thoroughly but gently to ensure even distribution.

**Dispensing and Sterilization:** Dispense the blood agar mixture into petri dishes or tubes. Properly label each container. Autoclave the filled containers to sterilize the medium, following standard autoclaving procedures.

**Solidification and Storage:** Allow the blood agar plates to cool and solidify in a horizontal position to ensure an even surface. Store the plates inverted (lid side down) to prevent condensation from accumulating on the agar surface. Store the plates at appropriate temperatures, usually between 2-8°C (36-46°F) for short-term storage or -20°C (-4°F) for long-term storage.

Blood agar is a versatile medium that supports the growth of a wide range of bacteria. It is particularly useful for identifying bacteria based on their hemolytic properties, as some microorganisms can lyse red blood cells, resulting in distinct patterns of hemolysis on the agar surface.



**Fig 9. Blood agar**

### 3. MACONKEY AGAR

Maconkey agar is a selective and differential culture medium used in microbiology to isolate lactose. Here's a general overview of how to prepare Maconkey agar:

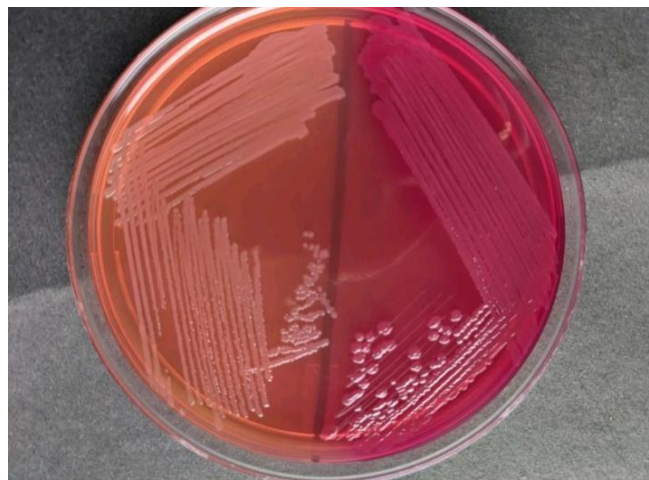
Ingredients:

- ✓ Peptone
- ✓ Lactose
- ✓ Bile salts
- ✓ Neutral red dye
- ✓ Crystal violet dye
- ✓ Agar

#### Water Steps:

- Dissolve peptone, lactose, and bile salts in distilled water, following the manufacturer's instructions or a standard recipe.
- Heat the mixture while stirring until all components are completely dissolved.
- Adjust the pH of the solution to around 7.1-7.5 using a pH meter or indicator and a suitable acid (e.g., hydrochloric acid or sodium hydroxide).
- Add neutral red dye and crystal violet dye to the solution. These dyes serve as indicators for lactose fermentation and inhibit the growth of Gram-positive bacteria, respectively.
- Once all components are mixed well, add agar to the solution. Agar serves as a solidifying agent.
- Heat the mixture while stirring until the agar is completely dissolved.
- Sterilize the medium using autoclaving or another suitable method.
- After sterilization, pour the medium into petri dishes or tubes, allowing it to solidify.
- Store the prepared Maconkey agar plates or tubes in a cool, dry place until ready for use.

It's essential to follow proper aseptic techniques during preparation to avoid contamination of the medium. Additionally, ensure that the medium is cooled sufficiently before pouring it into plates or tubes to prevent condensation



**Fig 10. MacConkey agar**

## CULTURE

### 1. URINE SAMPLE STREAK

- Use a sterile loop or swab to collect a small amount of urine from the sample.
- Flame the loop or swab to sterilize it.
- Open a sterile agar plate and label the bottom with relevant information such as patient's name and date.
- Use the loop or swab to streak the urine onto the agar plate in a zigzag motion, covering approximately one-third of the plate's surface.
- Flame the loop or swab again to sterilize it.
- Turn the plate 90 degrees and streak again, overlapping the first streak.
- Repeat this process once more, ensuring even distribution of the sample.
- Close the agar plate and incubate it according to laboratory protocols.
- Monitor the plate for bacterial growth, which may appear as colonies after incubation.
- Interpret the results based on the type and number of colonies present.

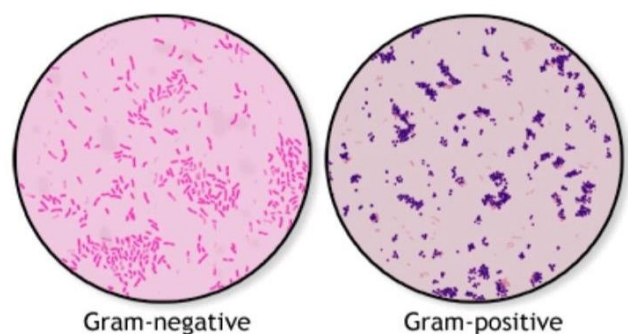


**Fig 11. Urine streak**

## GRAM STAINING

Gram staining is a fundamental technique used in microbiology to differentiate between two major groups of bacteria: Gram-positive and Gram-negative. Here's a basic outline of the procedure:

1. Prepare a bacterial smear: Take a small amount of bacterial culture and spread it thinly on a clean microscope slide. Let it air dry.
2. Fix the smear: Pass the slide over a flame a few times to heat-fix the bacteria. This kills the bacteria and adheres them to the slide.
3. Primary stain - Crystal Violet: Flood the smear with crystal violet stain for about 1 minute. This stains all cells purple.
4. Rinse with water: Rinse the slide with water to remove excess stain.
5. Gram's iodine (Mordant): Flood the smear with Gram's iodine solution for about 1 minute. This forms a complex with the crystal violet, enhancing its retention in Gram-positive bacteria.
6. Decolorization: Rinse the slide with alcohol or acetone for a few seconds until the runoff is colourless. This removes the stain from Gram-negative bacteria but not from Gram-positive ones.
7. Counterstain - Safranin: Flood the smear with safranin for about 30 seconds. This stains Gram-negative bacteria pink/red, as they have lost the crystal violet-iodine complex.
8. Rinse and dry: Rinse the slide with water, blot dry with bibulous paper, and observe under a microscope.
9. Gram-positive bacteria will appear purple, while Gram-negative bacteria will appear pink/red. Proper interpretation involves observing the morphology and arrangement of the stained bacteria.



**Fig 12. Gram staining**

## SEROLOGY

### 1) WIDAL TEST

#### Slide Wilda Test

To prepare for a Wilda test, we would require the following objects:

- Patient 's serum
- Pipette (lab tool)
- Serum
- S. Antigen (O, H, AH, BH)
- Slide
- Mix Stick
- Stopwatch
- You will also need reagents to detect antigens like O Ag (somatic or surface Ag), H Ag (flagella), AH Ag, BH Ag, etc.

The Wilda test procedure is carried out in two steps:

#### Qualitative Wilda Test

- For this test, you will use a slide with 6 reaction circles, marked as O, H, AH, BH, PC and NC. To begin with, Put one drop of the patient 's serum in four reaction circles, i.e., O, H, AH, BH. Add one drop of positive control in the PC circle and one in the NC circle.
- Next, add one drop of O antigen in the O circle, P antigen in the P circle, AH antigen in the AH circle, and BH antigen in the BH circle, respectively.
- Add any antigen, i.e., O, H, AH, BH in both PC and NC.
- Next, mix the serum and antigen in each circle properly so that the mixture doesn't go out of the circle and touch the slide.
- Also, one mixture should not mix with another, as it can influence the test results. Finally, rotate the slide in a slow circular motion to ensure a proper mixture of serum and reagent.



**Fig 13. Widal test**

## 2.HIV

**Sample Collection:** Collect a blood sample from the patient using standard venepuncture techniques. Ensure proper labelling of the sample to avoid any mix-up.

**Serum Separation:** Allow the blood sample to clot at room temperature, then centrifuge it to separate the serum from the clot. Transfer the clear serum into a clean, labelled tube using a pipette.

**Screening Test (ELISA or EIA):** Perform an enzyme-linked immunosorbent assay (ELISA) or enzyme immunoassay (EIA) to screen for HIV antibodies or antigens in the serum sample. Coat the wells of a microtiter plate with HIV-specific antigens or antibodies. Add the patient's serum to the wells and incubate. If HIV antibodies or antigens are present, they will bind to the antigens or antibodies in the well.

**Washing:** Wash the wells thoroughly to remove any unbound proteins or antibodies.

**Detection:** Add a detection antibody that is conjugated with an enzyme. This antibody will bind to any HIV antibodies or antigens that are bound to the antigen or antibody-coated wells.

**Substrate Addition:** Add a substrate solution that reacts with the enzyme conjugated to the detection antibody. This reaction produces a detectable signal, usually a colour change.

**Signal Measurement:** Measure the intensity of the signal in each well using a spectrophotometer or a similar instrument. The intensity of the signal is proportional to the amount of HIV antibodies or antigens present in the sample.

**Result Interpretation:** Compare the optical density (OD) or signal intensity of the sample wells to that of the control wells. If the sample OD exceeds a predetermined threshold, the sample is considered reactive or positive for HIV antibodies or antigens. If the sample OD is below the threshold, it is considered non-reactive or negative.

**Confirmation Test (Western Blot):** If the screening test is positive or reactive, confirm the result using a more specific test such as a Western blot. This test detects specific HIV antibodies in the serum sample and can confirm the presence of HIV infection.

**Result Reporting:** Report the results accurately, indicating whether the sample is reactive or non-reactive for HIV antibodies or antigens. Include any necessary interpretation or comments based on the findings.

**Counselling:** Provide pre- and post-test counselling to the patient, explaining the significance of the test results, available treatment options, and measures for prevention and control of HIV transmission.

**Follow-up:** Arrange for appropriate follow-up care, including further testing, treatment, and counselling, as needed.

Always follow standard operating procedures and adhere to safety guidelines while performing HIV serology testing to prevent contamination and ensure accuracy of results.

### 3) CRP TEST

CRP procedure microbiology

The CRP (C-reactive protein) procedure in microbiology typically involves measuring levels of CRP in blood samples. While CRP is not specific to any particular microorganism, elevated levels can indicate inflammation, which may be caused by various infectious agents such as bacteria, viruses, or fungi. CRP testing is often used as a non-specific marker of infection or inflammation, helping clinicians in diagnosing and monitoring infectious diseases

The CRP test procedure in a medical laboratory typically involves the following steps:

**Sample collection:** A blood sample is collected from the patient, usually via venepuncture.

**Sample processing:** The blood sample is processed to separate the serum or plasma from the cellular components.

**CRP assay:** The serum or plasma sample is then subjected to an immunoassay, often using techniques such as enzyme-linked immunosorbent assay (ELISA) or latex agglutination.

**Measurement:** The level of CRP in the sample is measured based on the assay results. This measurement is usually expressed in milligrams per liter (mg/L) or as a high sensitivity CRP (hs-CRP) measurement.

**Interpretation:** The CRP level is interpreted by healthcare professionals in conjunction with the patient's clinical symptoms and other diagnostic tests. Elevated CRP levels can indicate inflammation, which may be due to infection or other conditions such as autoimmune diseases or tissue injury.

**Reporting:** The results of the CRP test are reported to the healthcare provider who ordered the test, who then uses this information to aid in diagnosis and treatment decisions.



**Fig 14. CRP Test**

#### 4) HEPATITIS C VIRUS (HCV)

The procedure for testing for Hepatitis C Virus (HCV) typically involves:

**Blood Test:** A blood sample is collected from a vein in your arm. This sample is then sent to a laboratory for analysis.

**Screening Test:** The blood sample is initially tested for antibodies to the Hepatitis C virus (anti-HCV). If this test is positive, it means you have been exposed to the virus at some point.

**Confirmatory Test:** If the screening test is positive, a second test called the HCV RNA test is usually done to confirm the presence of the virus in your bloodstream. This test detects the genetic material (RNA) of the virus itself.

### **3.BLOOD BANKING**

#### **1.INTRODUCTION**

The blood bank system project report contains information related blood like

- ❖ Blood type
- ❖ Date of donation of blood
- ❖ Validity of blood
- ❖ Available blood group

A blood bank collects, separates, test, and stores blood until a patient needs it . if you ‘ve donated blood before you ‘ve blood part of the blood banking protested first blood banking the united states as established in 1937by Rebrand fantasy at cook county hospital in Chicago.

Blood banking is the process that takes place in the lab to make sure that donated blood, r boos products, ae safe before they are use in blood transfusion and other medical procedures. blood banking includes typing te blood for transfusion and testing for infection diseases.

#### **FUNCTIONS OF BLOOD BANK**

- Blood clotting, also called coagulation, is an important process that reduces bleeding when we are injured. It happens whenever a blood vessel is damaged, whether the injury is a scratch on the skin or something more serious.
- Blood vessels are like pipes taking blood where it needs to go. When a blood vessel is damaged blood can flow out. The body needs to stop the leak and repair the pipe (blood vessel).
- Injury triggers a reaction in the blood vessel, and activates platelets (specialised blood cell fragments) and clotting factors (specific proteins) in the blood, which work together to slow and stop the bleeding. A clot is formed over the damaged area, which the body will naturally dissolve when the injury has healed.
- First, the muscles in the wall of the blood vessel contract. This makes the blood vessel smaller so that there is reduced blood flow and less blood leaking out.
- Meanwhile, in the blood, the platelets start the repair process by plugging the leak. When a blood vessel is torn, collagen just under the lining becomes exposed. Platelets are attracted to collagen and move to the site of the injury. The cells lining the blood vessel release von Willebrand factor into the blood which attaches to the platelets. It acts like glue, helping the platelets stick together and stick to the collagen. The platelets change shape, from smooth discs to spiny spheres. These activated platelets secrete chemicals into the blood to signal other platelets to the area to help the process. So, the platelets clump together and stick to the inside wall of the damaged blood vessel, forming a plug that patches and closes the wound temporarily. This process only takes a few seconds.

## 1. BLOOD DONOR

Donor selection criteria.

Good health of the donor must be fully ensured. The universally accepted criteria for donor selection are:

- Age between 18 and 60 years
- Haemoglobin - not less than 12.5 g/Dl
- Pulse - between 50 and 100/minute with no irregularities
- Blood Pressure -Systolic 100-180 mm Hg and Diastolic 50 - 100 mm Hg Temperature - Normal (oral temperature not exceeding 37.50C)
- Body weight - not less than 45 Kg

**Health conditions:** The donor should be in a healthy state of mind and body. They should fulfill the following criteria:

Past one year - not been treated for Rabies or received Hepatitis B immune globulin.

Past six months - not had a tattoo, ear or skin piercing or acupuncture, not received blood or blood products, no serious illness or major surgery, no contact with a person with hepatitis or yellow jaundice.

Past three months - not donated blood or been treated for Malaria.

Past one month - had any immunizations.

5. Past 48 hours - taken any antibiotics or any other medications (Allopathic or Ayurveda or Siddha or Home)

Past 24 hours - taken alcoholic beverages

Past 72 hours - had dental work or taken Aspirin

Present - not suffering from cough, influenza or sore throat, common cold

Women should not be pregnant or breast feeding her child

Women donor should not donate during her menstrual cycles

Free from Diabetes, not suffering from chest pain, heart disease or high BP, cancer, blood clotting problem or blood disease, unexplained fever, weight loss, fatigue, night sweats, enlarged lymph nodes in armpits, neck or groin, white patches in the mouth etc. Ever had TB, bronchial asthma or allergic disorder, liver disease, kidney disease, fits or fainting, blue or purple spots on the skin or mucous membranes, received human pituitary - growth hormones etc. Donor rejection

The following patient are not eligible for donating blood

- Affected with HIV viruses or EIDS
- If the patient had undergone any open-heart surgeries
- Donor the lady in pregnant
- Cancer patient, kidney disorder TB patient ae not eligible
- Low haemoglobin or anaemic
- when tattooed
- Allergic
- High blood pressure
- Unexpected weight loses of more the 5kg over 6 months

- Alcohol
- Smoker
- Organ transplantation
- Any fever
- Diabetes patient



**Fig 15. Blood donor**



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

EGMORE : 130, Marshalls Road,  
Egmore, 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

### BLOOD DONOR CONSENT FORM

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| LOCATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  | DATE :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |
| குருதி கொடையாளர் பூர்த்தி செய்ய வேண்டியவை<br>TO BE FILLED BY DONOR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  | குருதி வங்கி ஊழியர் பூர்த்தி செய்ய வேண்டியவை<br>TO BE FILLED BY BLOOD BANK STAFF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |
| TYPE OF DONOR : VOLUNTARY REPLACEMENT<br>தேதி / Date :<br>பெயர் / Name :<br>முகவரி / Address :<br>மின்னஞ்சல் முகவரி / E-mail ID :<br>மொபைல் எண் / Mobile No. :<br>கல்லூரி (அ) அலுவலக முகவரி / College or Company Address :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  | Blood Group: HB: Sign of LT :<br><b>TO BE FILLED BY MEDICAL OFFICER</b><br>Pulse : FIT / UNFIT<br>BP : Reason :<br>Temp :<br>CVS :<br>RS : Signature of Medical Officer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| பாலினம் / Gender : Male Female<br>பிறந்த தேதி / Date of Birth :<br>இரத்த பிரிவு / Blood Group :<br>கடைசிவரக இரத்த தானம் செய்த தேதி / Last Donation Date :<br>மொத்த இரத்த தானம் அளித்தது / Total No. of Donation :<br>சாப்பிட்டு எத்தனை மணி நேரம் ஆகிறது? / When did you had your last meal?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  | TYPE OF BLOOD BAG USED<br>SINGLE DOUBLE TRIPLE QUADRUPLE<br>Quantity : 350ml / 450ml<br>BLOOD BAG NUMBER :<br>SEGMENT NUMBER :<br>BLOOD DONATION TIME : START TIME :<br>END TIME :<br>PHELEBOTOMIST :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| கொடையாளருக்கு வேண்டிய தகுதிகள் / Donor Eligibility Criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |
| வயது / Age : 18 - 65 Years                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  | எடை / Weight : >45 Kgs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |
| இரும்பு சத்து / Hemoglobin : 12.5 gms%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  | நாடித்துடிப்பு / Pulse : 60-100 / minute                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |
| இரத்த அழுத்தம் / B.P. : 100 / 60 - 140/90 mm Hg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |
| நிரந்தர தடை / PERMANENT DEFERRAL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |
| 1. உயர் இரத்த அழுத்தம் / வினாவாக பக்கவாதம் ஏற்பட்டுள்ளதா?<br>H/O Uncontrolled Blood Pressure / Stroke?<br>2. இதய நோய் சம்பந்தப்பட்ட மருந்துகள் உட்கொள்பவரா?<br>H/O Heart Disease or Anti Arrhythmic?<br>3. வலிப்பு சம்பந்தப்பட்ட / புற்றுநோய் மருந்துகள் உட்கொள்பவரா?<br>H/O Epilepsy or Anticonvulsants or Cytotoxic drugs?<br>4. அறிக இரத்தப்போக்கு / கசிவு ஏற்பட்டுள்ளதா?<br>H/O Abnormal bleeding tendencies / Enzyme Deficiencies with known history of Hemolysis ?<br>5. சர்க்கரை நோய் சம்பந்தப்பட்ட இன்கலின் மருந்துகள் உட்கொள்பவரா?<br>H/O Diabetes mellitus or treatment with Insulin or Hypoglycemic drugs?<br>6. கல்லீரல் நோய் / பித்தப்பை நோய் / சிறுநீரக நோய் உள்வரா?<br>H/O Chronic liver Disease or endocrine disorders / Chronic Kidney disease?<br>7. நாய்ப் தளர்ச்சி / பக்கவாத நோய் உள்வரா?<br>H/O Parkinsons diseases?<br>8. சொறி சிறங்கு நோய் நோய் சம்பந்தப்பட்ட வியாதிகள் அதற்கு உட்கொள்பவருக்கு உட்கொள்பவரா?<br>H/O Psoriasis or treatment for the same?<br>9. மனநல மருந்து சிகிச்சை பெற்று இருக்கிறார்களா?<br>H/O Psychiatric disorders / Schizophrenia? |  | 10. சிறுநீரகம் / இதயம் / கல்லீரல் / மூளை சம்பந்தப்பட்ட மிகப்பெரிய அறுவை சிகிச்சை நிகழ்ந்துள்ளதா?<br>H/O Major surgeries for Kidney, Heart, Liver or Brain?<br>11. ஆலதய/அலர்ஜி நோய் அறிகாசம் அறிகாசம் பெற்றுள்ளதா?<br>H/O severe allergic disorders or Asthmatic on steroid therapy?<br>12. போதை மருந்து / திரவங்கள் / பாலியல் தொழில் / ஒரினச்சேர்க்கை, பாலியல் நோய் / எய்ட்ஸ் உள்வரா?<br>H/O Injection Drug users / Transgender / Female Sex Worker Persons with Multiple Sex Partners / Homosexual / STD / AIDS?<br>13. மேகல்டை நோய் / சிபிலிஸ் உள்வரா?<br>H/O Gonorrhea Disease / Syphilis ?<br>14. கருப்பைச்சகல் / தொழுநோய் உள்வரா?<br>H/O Leishmaniasis disease / Leprosy<br>15. புற்றுநோய் பாதிக்கப்பட்டவரா / புற்றுநோய் அறுவை சிகிச்சை செய்யப்பட்டவரா?<br>H/O Cancer disease / Surgery for cancer<br>16. Autoimmune diseases like SLE, RA, Ankylosing Spondylitis, Dermatomyositis, Scleroderma<br>17. முந்தைய இரத்த தானத்திற்கு பிறகு மயக்கமடைந்திருக்கிறார்களா?<br>H/O 2 Consecutive faints following a blood donation?<br>18. மாற்றுறுப்பு அறுவை சிகிச்சை செய்தவரா?<br>H/O Recipients of organ / System Cells / Tissue Transplant |  |

Fig 16. Blood Donor Consent Form

### **3. BLOOD BAG**

#### **BLOOD BAG TYPES**

Advance Care manufactures four types of Blood Transfusion Bags in the Acute Point range:

- Single Blood Bag: used for collection, preservation, and transfusion of human blood.
- Double Blood Bag: separates red blood cells and plasma. It includes a primary bag and a satellite bag.
- Triple Blood Bag: this system separates red blood cells, plasma and buffy coat (includes leucocytes and platelets). It is made of a primary bag and two satellite bags.

#### **USAGE**

- ✓ Open the outer wrap at the tear nicks and take off one blood bag system;
- ✓ Apply the blood pressure cuff on the donor 's arm, identify injection site and release the cuff;
- ✓ Disinfect the injection site. Cover the area with sterilized gauze;
- ✓ Hang the tube onto patient 's wrist in order to not compress the needle;
- ✓ Apply the needle immediately;
- ✓ Tie the needle to the patient 's arm;
- ✓ Make sure there is continuous blood flow. If so, the blood collection is expected to be completed in around 12 minutes;
- ✓ Collect the quantity of blood following the instructions indicated on the bag label. Monitor the blood being drawn;
- ✓ After blood collection is over, collect the blood needed and stop the collection by fastening the blood collection tube;
- ✓ Untie the lace or deflate the blood pressure cuff;
- ✓ When the procedure is done, hold the hub with one hand to remove the needle while holding the sterile gauze with the other hand. Pull the hub without exerting too much pressure. Let the patient keep sterilized gauze on the injection site;
- ✓ Hold the needle with one hand to keep the tip in the upper position and wait for the blood to flow off through the tube;
- ✓ Clamp the bag tube;
- ✓ Make sure all the patient information required are written on the label of the blood transfusion bag

### **4. BLOOD DONOR**

#### **PROCEDURE:**

- ✓ You lie or sit in a reclining chair with your arm extended on an armrest.
- ✓ If you have a preference for which arm or vein is used, tell the person who is collecting your blood.
- ✓ A blood pressure cuff or tourniquet is placed around your upper arm to fill your veins with more blood. This makes the veins easier to see and easier to insert the needle into. It also helps fill the blood bag more quickly.
- ✓ Then the skin on the inside of your elbow is cleaned.
- ✓ A new, sterile needle is inserted into a vein in your arm.

- ✓ This needle is attached to a thin, plastic tube and a blood bag.
- ✓ Once the needle is in place, you tighten your fist several times to help the blood flow from the vein.
- ✓ First, blood is collected into tubes for testing. Then blood is allowed to fill the bag, about a pint (about half a litre).
- ✓ The needle is usually in place about 10 minutes.
- ✓ When your donation is finished, the needle is removed, a small bandage is placed on the needle site and a dressing is wrapped around your arm.

## 5. DONOR COUNSELLING

### BEFORE BLOOD COLLECTION:

Before you can donate blood, you will be asked to fill out a confidential medical history. It includes questions about behaviours known to carry a higher risk of bloodborne infections — infections that are transmitted through blood.

Because of the risk of bloodborne infections, not everyone can donate blood. The following are groups that are not eligible to donate blood:

- ✓ Anyone who has used injected drugs, steroids or another substance not prescribed by a health care provider in the past three months
- ✓ Men who have had sexual contact with other men in the past three months
- ✓ Anyone who has a congenital coagulation factor deficiency
- ✓ Anyone who has had a positive test for HIV
- ✓ Anyone who has engaged in sex for money or drugs in the past three months
- ✓ Anyone who, in the past 12 months, has had close contact with — lived with or had sexual contact with — a person who has viral hepatitis
- ✓ Anyone who has had babesiosis, a rare and severe tick-borne disease, or the parasitic infection Chagas' disease
- ✓ You will also have a brief physical exam. The exam includes checking your blood pressure, pulse and temperature.
- ✓ A small sample of blood is taken from a finger prick and is used to check the oxygen carrying part of your blood (haemoglobin level). If your haemoglobin concentration is within a healthy range, and you've met all the other screening requirements, you can donate blood.

### AFTER BLOOD COLLECTION:

After donating, you sit in an observation area, where you rest and eat a light snack. After 15 minutes, you can leave. After your blood donation:

- ✓ Drink extra fluids.
- ✓ Avoid strenuous physical activity or heavy lifting for about five hours.
- ✓ If you feel lightheaded, lie down with your feet up until the feeling passes.
- ✓ Keep your bandage on and dry for the next five hours.
- ✓ If you have bleeding after removing the bandage, put pressure on the site and raise your arm until the bleeding stops.
- ✓ If bruising occurs, apply a cold pack to the area periodically during the first 24 hours.
- ✓ Consider adding iron-rich foods to your diet to replace the iron lost with blood donation.

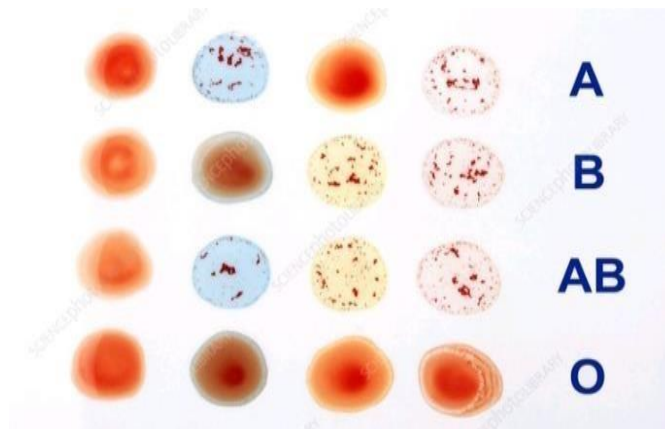
## 6. BLOOD GROUPING

There are 4 main groups

- A
- B
- AB
- O

❖ There are 4 main groups defined by the ABO System; blood group A – has A antigens on the red blood cells and anti – B antibodies in the plasma, blood group B – has B antigens with anti – A antibodies in the plasma, blood group O – has no antigens, but both anti – A and anti – B antibodies in the plasma

❖ A blood typing test is used to identify your blood group. For the test, your blood sample is mixed with anti A and anti B antibodies and checked to see if the blood cells stick together (Agglutinate). The serum (The liquid part of the blood without cells) is then mixed with type A and Type B blood.



**Fig 17. Blood grouping**

## 7. BLOOD SCREENING

- ❖ This is to make sure that patients receive blood that matches their blood type.
- ❖ Before transfusion, the donor and blood unit are also tested for certain additional proteins (Antibodies) that may cause adverse reaction in a person receiving a blood transfusion

### HIV

- ✓ Lab tests use a blood sample taken from a vein. In general, lab tests can find antibodies soon after infection than other HIV antibodies tests.
- ✓ Test results are usually ready a few days after your blood sample is taken.
- ✓ Rapid tests use blood from your finger, saliva, urine. They provide results in about 30mins.
- ✓ Hepatitis B Virus
- ✓ Hepatitis B is a vaccine – preventable live infection caused by the hepatitis B virus HBV
- ✓ Hepatitis B is spread in blood, semen, or other body fluids from a person infected in the virus enters the body of someone who is not infected Procedure.
- ✓ Treatment to prevent hepatitis B infection after exposure
- ✓ An injection of immunoglobulin (An antibody) given within 24 hours of exposure to the virus may help protect you from getting sick with hepatitis B

## HCV

- ✓ The hepatitis C antibody test is a blood test that assesses the number of antibodies in the blood.
- ✓ The test requires a simple blood sample that is usually drawn out from a vein in the forearm
- ✓ Apart from that there is no special requirement needed

## VDRL

Screening test for syphilis. It measures substances (proteins), called antibodies, which your body may produce if you have come in contact with the bacteria that cause syphilis.

## Malaria

Malaria parasites can be identified by examining under the microscope a drop of the patient's blood, spread out as a blood smear on a microscope slide prior to examination, the specimen is stained to give the parasites a distinctive appearance.



**Fig 18. HCV**

## 6. BLOOD COMPONENTS SEPARATION

### TECHNIQUE:

Many blood separation techniques depend on centrifugation to achieve optimum separation of blood in collection tubes. The size of the collection tube should be appropriate for the blood separation centrifuge that will be used. At CAPP, we make centrifuges that are well suited for blood cell separation, blood plasma separation as well as many other applications (PRP, PPP, Stem-Cell, etc.). To handle these various applications, CAPP has developed two types of blood separation centrifuges. These blood separation centrifuges use either a swingout rotor or a fixed-angle rotor. The rotors of CAPP blood separation centrifuges can handle tubes of various capacities (i.e., 1.5mL, 2mL, 5mL, 7mL, 10mL, or 15mL).

As an alternative to blood separation machines with a swing-out rotor, some blood separation centrifuges have a fixed-angle rotor. Fixed-angle rotor blood separation machines spin blood components to the opposite side of the tube from which they then slide down to the bottom. This blood separation technique, coupled with the higher centrifugal forces of fixed-angle blood separation centrifuges, results in faster blood separation. The speed advantage of these blood separation machines is significant and research laboratories preferentially use blood separation centrifuges with fixed-angle rotors for their analyses. CAPP supplies two blood separation centrifuges with fixed-angle rotors i.e., the CAPP Rondo Basic Clinical Centrifuge CRC-658 and the CAPP Rondo Advanced Clinical Centrifuge CRC-416X.

The CAPP Rondo Basic Clinical Centrifuge accommodates 8 tubes of different capacities, making it one of the most flexible blood separation centrifuges on the market. The rotor is designed to handle most of the common tube sizes with capacities that include 1.5mL, 2mL, 5mL, 7mL, 10mL, and 15mL. This blood separation machine spins blood samples at speeds of up to 6,500 RPM corresponding to a centrifugal force of 3,873g. On the higher end of the spectrum is the CAPP Rondo Advanced Clinical Centrifuge CRC-416X which features two fixed-angle rotors of 8x15mL and 16x10mL. Both blood separation machines are perfectly suited for high-efficiency blood separation with repeatable accuracy

## 7. BLOOD COMPONENTS STORAGE

- ✓ Plasma
- ✓ Red blood cells
- ✓ White blood cells
- ✓ Platelets

Blood has many different functions including transporting oxygen and nutrients to the lungs and tissues.

### Fresh frozen plasma

Fresh frozen plasma is obtained after centrifugation of whole blood and red cell removal, the plasma must be frozen within 8 hours after collection in order to preserve coagulation factors and other plasma proteins.

❖ Because plasma can be stored for a long-time plasma is kept in quarantine until it comes donor back for a new donation so that he can be tested again for the infection disease markers, the gives optimal security because early infection detection at the moment of donation have no become apparent

❖ Fresh frozen plasma (plasma separated from a unit of blood within 6-8 hrs of donation and rapidly frozen is stored in blood transfusion centre at 40 degree C or colder .it has a shelf life of one year.



**Fig 19. Fresh frozen plasma**

### Packed red blood cells

❖ Packed red blood cells from a donation of 450ml of whole blood are obtained after centrifugation and plasma then suspended in a nutritive solution

❖ As per standard guidelines (22) the storage temperature for red cells is between +2 degree C and +6degree C, for platelets and leucocytes – between +20degree C and +24 degree C and for plasma products, below 18-degree C. In addition, separate equipment is required for keeping safe cross –matched units if available.

## Whole blood

- ✓ Whole blood is made up of red blood cells, platelets, all of which are suspended in a liquid called plasma
- ✓ whole blood for separation of platelets should be kept at 20-24 degree C before processing as lower temperature affect platelet function and its separation ... platelets should be prepared within 8hrs of phlebotomy and stored to prevent aggregation which can result in loss
- ✓ are obtained after centrifugation and plasma then suspended in a nutritive solution
- ✓ As per standard guidelines (22) the storage temperature for red cells is between +2 degree C and +6degree C, for platelets and leucocytes –between +20degree C and +24 degree C and for plasma products, below -18 degree C.
- ✓ In addition, separate equipment is required for keeping safe cross –matched units if available



Fig 20. Whole Blood

## 8. BLOOD ISSUING

### Procedure

- ✓ Donor blood type on units, Transfusion Record and Unit Issue screen of BBIS. Donor unit number on unit, Transfusion Record form, Unit Issue screen of BBIS and Blood Release form.
- ✓ Compatibility testing results on Transfusion Record form. Patient name and hospital ID number on Blood Release form, Transfusion Record form Unit Issue screen of BBIS.
- ✓ BB ID number on Blood Release form, Transfusion Record form, and unit tag.
- ✓ Expiration date/time on unit and Transfusion Record form. Doctor's Orders for Blood/BloodProduct has been received by the BTS and checked for unit quantity and product.
- ✓ Tech must ensure an order for transfusion exists prior to releasing blood/blood product.
- ✓ Special Requirements indicated by —Patient Instructions, such as irradiation, antigenegative are met.
- ✓ During the sign-out procedure the Blood Release form is completed with the unit number, time, date and the transporter's signature.
- ✓ The BTS technologist and the transporter must confirm agreement between the donor unit number and blood transfusion.

## 9. CROSS MATCHING

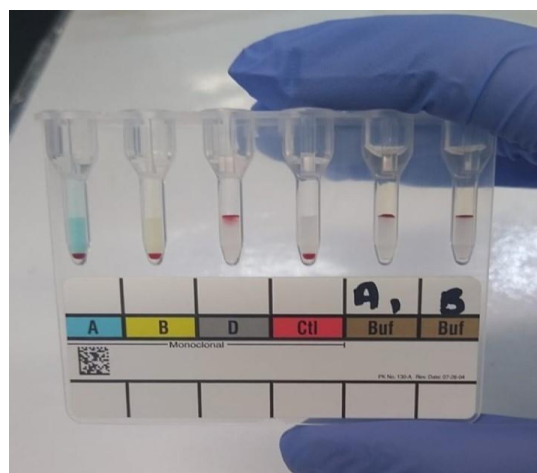
- ✓ A crossmatch is performed prior to administration of blood or blood products eg packed red blood cells.
- ✓ The purpose of the crossmatch is to detect the presence of antibodies in the recipient against the red blood cells of the donar
- ✓ These antibodies attach to the red bood cells of the donar after tranfusion

### Major cross matching

1. Prepare donor and recipient's blood sample: **Donor's red cells and recipient's serum/plasma.**
2. Prepare 3-5% saline cell suspension of red cells.
3. Label a test tube.
4. Add two drops of recipient's serum and one drop of donor cell suspension.
5. Mix and incubate the tubes at 37 degree Celsius for about 60 minutes.
6. Decant the serum completely and wash the cells three times in saline.
7. Add two drops of Anti-human Globulin (AHG) and mix. Allow to stand at room temperature for 5 minutes.
8. Centrifuge at 1500 rpm for 1 minute.
9. Observe macroscopically and microscopically for agglutination.
10. If macroscopic agglutination is not observed, transfer a small amount onto a glass slide and examine for microscopic agglutination. Rouleaux is not an indication of incompatibility

### Minor Cross Match

1. Prepare donor and recipient's blood sample: **Recipient's red cells and donor's serum/plasma.**
2. Label a test tube.
3. Add two drops of donor's serum and one drop of recipient's cell suspension.
4. Mix and incubate the tubes at 37 degree Celsius for about 60 minutes.
5. Decant the serum completely and wash the cells three times in saline.
6. Add two drops of Anti-human Globulin (AHG) and mix. Allow to stand at room temperature for 5 minutes.
7. Centrifuge at 1500 rpm for 1 minute.
8. Observe macroscopically and microscopically for agglutination.
9. If macroscopic agglutination is not observed, transfer a small amount onto a glass slide and examine for microscopic agglutination. Rouleaux is not an indication of incompatibility



**Fig 21. Cross matching**

## 10. BLOOD BANKING RECORD:

- ✓ All transfusion records in the recipients medical chart shall be retained in accordance with care facility policy.
- ✓ A complete record pertaining to the identification of the blood component including Transfusion Medicine Laboratory testing results and worksheets and the collecting facility shall be retained indefinitely.
- ✓ The recipient transfusion data file in the Transfusion Medicine Laboratory shall be retained indefinitely.

For each blood component issued, a record system shall be in place which documents:

- Recipient's name and identification number
  - Recipient's ABO group
  - Recipients Rh group
  - Identification number and name of blood component
  - ABO group of the blood component
  - Rh group of the blood component for red cells, platelets and granulocytes
  - Compatibility verification for red cells and granulocytes
  - Visual inspection
  - Date and time of issue
  - Identity of the person issuing the blood component
  - Identity of the person transporting the blood component to the recipient's location
- 
- ✓ Records of inspection of blood components and blood products prior to issue shall be retained for five years.
  - ✓ Records for all facilities shall ensure that it is possible for blood components and blood products to be traced from its source to final disposition. The record system must provide a means to locate and access all records related to a given blood component or blood product. These records must be kept indefinitely. The Transfusion Medicine Laboratory shall develop and maintain records that demonstrate that the quality system is operating in an effective manner.
  - ✓ Healthcare employee signatures, initials and computer identification shall be retained for ten years.

## CONCLUSION

Had a great experience and learned a lot new things about blood banking and its maintenance donor selection ,handling blood units components separation ,storage detecting groups, cross matching compatibility tests ,and to record and register date of individual donor and recipient information .by observing all the given things I conclude that the company is of big scale industry , the LIONS BLOOD BANK has all the essential guidelines for maintaining quality and safe blood transfusions

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CHENGALPATTU MEDICAL COLLEGE, CHENGALPATTU - 603001  
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**GOVT. CHENGALPATTU MEDICAL COLLEGE, CHENGALPATTU 603001**  
**TAMILNADU**  
**CERTIFICATE OF OBSERVERSHIP**

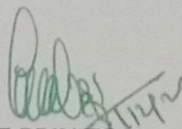
This is to certify that the following students studying in Sathyabama Institute of Science and Technology, Chennai has undergone observership for a period of One Month From 01.11.2023 & 30.11.2023 in the Department of Microbiology & Histopathology at Chengalpattu Medical College, Chengalpattu-603001.

| Sl.No. | Name of the Student | Department                          | Period of posting              |
|--------|---------------------|-------------------------------------|--------------------------------|
| 1      | Mary G              | Microbiology<br>&<br>Histopathology | 01.11.2023<br>to<br>30.11.2023 |
| 2      | Stephen Xavier M    |                                     |                                |
| 3      | Oviya M.S           |                                     |                                |
| 4      | Monika G            |                                     |                                |
| 5      | Sowmiya S           |                                     |                                |
| 6      | Shakeera Banu K     |                                     |                                |
| 7      | Beruthose Banu S    |                                     |                                |
| 8      | Ajith C             |                                     |                                |
| 9      | Santhosh Kumar M.S  |                                     |                                |

They attend the training during the above period has been

Good.



  
VICE PRINCIPAL

Chengalpattu Medical College,  
Chengalpattu.

Date:21.12.2023

Place:Chengalpattu.

ச.சி  
21/12/23

*Sharing Life. Saving Lives..since 1984*



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

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

**TO WHOMSOEVER IT MAY CONCERN**

This is to certify that Ms. Sowmiya. S, 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, Egmore, Chennai - 08. 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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