

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.PRAKASH. K (Reg. No: 41737012)



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

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DEPARTMENT OF MEDICAL LABORATORY TECHNOLOGY

BONAFIDE CERTIFICATE

This is to certify that this internship report is the bonafide work of Prakash.K who have done the project work as a team and carried out the training program at **GERICARE HOSPITAL AADAMBAAKAM** and **LIONS BLOOD BANK AND RESEARCH FOUNDATION EGMORE** under our supervision from August 2023 to April 2024.

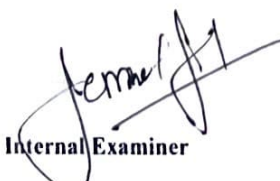

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(Dr. James John)

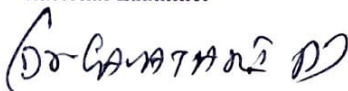

Head of the Department

(Dr. J. Premkumar)

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Submitted for Viva voce examination held on 12th April 2024


Internal Examiner

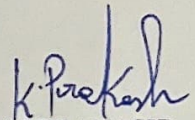

External Examiner


DECLARATION

I, Mr. PRAKASH.K (41737012), 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 "GERICARE HOSPITAL at Aadambaakam" under the guidance of Dr. JAMES JOHN at Sathyabama Institute of Science and Technology is submitted in partialfulfilment of the requirements for the award of Bachelor of science degree in MEDICAL LABORATORY TECHNOLOGY.

Date: 12/4/24

Place: CHENNAI


(K.PRAKASH)

ACKNOWLEDGMENT

We are pleased to acknowledge our sincere thanks to **Board of Management of SATHYABAMA Institute of Science and Technology** for their kind encouragement

In doing this internship program and for completing it successfully. We 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 the internship.

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.

SYNOPSIS

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INDRODUCTION

A blood bank is a center where blood gathered as a result of blood donation is stored as preserved for later use in blood transfusion. The term 'Blood Bank' typically refers to a division of a hospital where the storage of blood products occurs and where proper testing is performed,

FUNCTIONS OF BLOOD BANK

The main functions of the blood bank are;

- Recruitment donors and maintenance of donor's record.
- Collection, preservation, and distribution of blood and blood components.
- Laboratory procedures like, testing for hepatitis B, Hepatitis C, HIV, VDRL for syphilis and Malaria Parasite.
- Teaching training and research
- Clinical and therapeutic functions like transfusion and day care service.



Figure1: blood collection

DONOR SELECTION AND REJECTION CRITERIA

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 50-100mm Hg.
- Temperature – Normal (oral temperature not exceeding 37.5°C).
- Body weight – not less than 45 Kg
- **Health Conditions:** The donor should be in a healthy state of mind and body.
- They should fulfil 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 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.
 - Past 24 hours – taken alcoholic beverages.
 - Past 48 hours – taken any antibiotics or any other medications (Allopathic or Ayurveda or Siddha or Homeo)
 - 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, fits or fainting blue or purple spots the skin or mucous membranes, received human pituitary – growth hormones etc.

REJECTION CRITERIA

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

BLOOD BAG & ITS TYPES

The units are collected either as whole blood into bags containing anticoagulant citrate and nutrient phosphate and dextrose (CPD) or by apheresis into acid citrate dextrose (ACD). The whole blood is centrifuged to bring down the heavier red cells. And the red cells separated from the rest of the blood.

TYPES:

1. Single Blood Bag:

Used for collection, preservation, and transfusion of human blood.

2. Double Blood Bag:

Separates red blood cells and plasma. It includes a primary bag and a satellite bag.

3. Triple Blood Bag:

This system separates red blood cells, plasma and buffy coat.



Figure2: blood bag

- Things To Read.
- Please Take Care to Identify the Patient. Please Furnish All the Details Mentioned In Requisition Form. Otherwise, It Will Be Not Accepted.
- Result Of Special Tests If Performed: Date
- Patient's Blood Group. Compatibility Test Report.
- Expiry. Date.

Figure3: Blood donor consent form

BLOOD DONATION PROCEDURE

Registration:

The medical team goes over basic eligibility and donation information. You will show you donor card and driver's license.

Medical History:

You will answer some question about your health history and places you have travelled.

Mini physical:

We will check your temperature, pulse, blood pressure and hemoglobin level present in a sample of blood.

Blood Donation:

The actual donation takes about 8-10 minutes, during which you will be seated comfortably

Refreshments:

Done! Time to have a snack and something to drink.

DONOR COUNSELLING

- Motivated the donor at high risk to test for HIV
- Help the donor to take the right decision
- Creates awareness among the donors on HIV/AIDS and TTIs □ Encourage voluntary blood donors to donate regularly.
- Absence of a programme on counselling of blood donors, deprives them
- Of their right health status and plan behaviour modifications
- An opportunity to the donor to self-exclude from donation
- To clarify myths and misconceptions
- To understand the consequences of transfusion transmitted infections

BLOOD GROUPING PRINCIPLE:

Testing with both Anti – A and B is necessary to determine if red blood cells possess or lack A and / or B blood group antigens. Absence of agglutination is a negative test result, which indicates the corresponding antigen is not demonstrable. Agglutination of red blood cells with a given reagent is a positive test result, which indicates the presence of the corresponding antigen on the red blood cells.



Figure4: blood grouping reagents

PROCEDURE:

- First mix the patient blood with three different reagents including either of 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

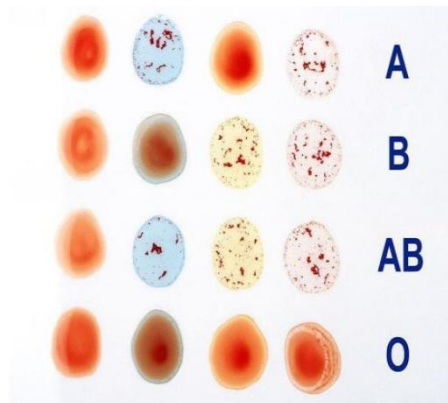


Figure5: Agglutination

SCREENING DONOR

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 done with blood from a finger stick can take 19 to 90 days after exposure.

HBV:

normal hepatitis n core antibody result are negative. A positive hepatitis b core antibody test may mean you a current or past hepatitis B infection. A positive hepatitis B surface antibody test means you are protected against the hepatitis b virus.

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, sometime called the anti – HCV test, looks for antibodies to the hepatitis C virus in blood.

MALARIA:

The Dia Med ELISA malaria antibody test is based on binding of anti-plasmodium antibodies present in a serum sample to antigens immobilized on 96 well plates. The antigens are a mixture of a total extract of cultured plasmodium falciparum and recombinant plasmodium vivax antigen.

BLOOD COMPONENTS:

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

PACKED RED BLOOD CELLS:

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

FRESH FROZEN PLASMA:

Fresh frozen plasma is obtained after centrifugation of whole blood and red cells removal, or through direct separation (plasmapheresis), The plasma must be frozen within 8 hours after collection in order to preserve coagulation factors and others plasma proteins.

STORAGE: 30-degree celcius for up to 2 years

Plasma can also be fractionated and processed into stable blood products, such as albumin, immunoglobulins, coagulation factors.

PLATELETS:

Platelets are mainly obtained through Thermophoresis. Platelet products formerly obtained from a mix of more than 10 buffy coats can now be obtained from a single Thermophoresis of about 40 minutes.

STORAGE:

20–24-degree Celsius for 5 days, under constant mixing of the bags (platelets aggregation occurs in the cold and in absence of agitation).



Figure6: Blood components & Their Separation

BLOOD ISSUE

BLOOD GROUP:

Testing with both Anti – A and B is necessary to determine if red blood cells possess or lack A and / or B blood group antigens. Absence of agglutination is a negative test result, which indicates the corresponding antigen is not demonstrable. Agglutination of red blood cells with a given reagent is a positive test result, which indicates the presence of the corresponding antigen on the red blood cells.

CROSS MATCHING:

The cross-match test is used to detect the presence of blood group antibodies in a recipient's serum/plasma to antigen on donor red blood cells, in this test, the donor red blood cells in a hypotonic buffered saline solution are combined with patient serum/plasma to antigen/antibody interaction in the upper chamber the microtube. This result in promoting antibody uptake. The detection of this antibody occurs when the sensitized red blood cells react with the anti-IgG gel in the microtube during centrifugation.

CROSS MATCHING:

The cross-match test is used to detect the presence of blood group antibodies in a recipient's serum/plasma to antigen on donor red blood cells, in this test, the donor red blood cells in a hypotonic buffered saline solution are combined with patient serum/plasma antigen /antibody interaction in the upper chamber the microtube. This result in promoting antibody uptake. The detection of this antibody occurs when the sensitized red blood cells react with the anti-IgG gel in the microtube during centrifugation.

MAJOR CROSS MATCHING

- Prepare 1% red cell suspension (Donor Cells) -add 10ul packed cell to 1 ml of LISS.
- Add 50ul of donor's cell suspension (1%) to the appropriate microtube.
- Add 25ul of the recipient plasma/serum to the appropriate microtube.
- Incubate at 37c for 15 minutes in a dry incubator.
- Centrifuge the card for 10 minutes in the ID centrifuge read the reaction.

MINOR CROSS MATCHING

- Prepare 1% red cell suspension (Patients Cells) -add 10ul packed cell to 1 ml of LISS.
- Add 50ul of patient cell suspension (1%) to the appropriate microtube.
- Add 25ul of the recipient plasma/serum to the appropriate microtube.
- Incubate at 37c for 15 minutes in a dry incubator.
- Centrifuge the card for 10 minutes in the ID centrifuge read the reaction.

BLOOD BANK RECORD

There must be a written record retained by the blood transfusion laboratory of: (i) identification of the patient for whom blood is collected, (ii) unique donation number of pack collected, (iii) time of collection, (iv) name of person collecting

QUALITY ASSURANCE SYSTEM-

- Organization and management
- Equipment
- Supply and customer issues
- Process control
- Documents and records
- Deviations non - conformance and complications

LOG OF REAGENTS

- Lot number
- Batch number
- Expiry date
- Name of manufacture ▪ Date of receipt and put in use



Figure7 : blood bank record

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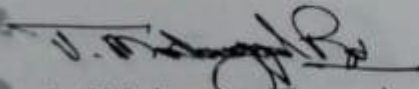
Date: 12th Dec 2022

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Ms. Pavithra. R, 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 28th Nov 2022 to 3rd Dec 2022.

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

We wish him all the best for her upcoming career.


Ln.J.Madanagopal Rao
Chairman



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

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Chennai - 600 058. Tel : 48504959
Mob : 99419 17505
E-mail : info@lionsbloodbank.net

CONCLUSION:

- Blood transfusion or its products is an invaluable therapeutic measure which should be with good reasons because of its potential hazards.
- Blood loss in during a surgical procedure should be minimized.
- RBC booster should be given pre and postoperatively to patients.
- This report presents the blood bank management system related issues.
- Problem to calculate amount of blood in stock.
- Difficulty in identifying blood expiry date.
- In future we must overcome this drawback by using modern technologies.



**Figure8: LIONS BLOOD BANK
EGMORE**