

ABSTRACT

With the emergence of Transfusion Medicine Department the definition of Blood Bank has changed. Today, it is not just a bank to collect & issue blood, it prepares and supplies individual blood component, to the patients as and when the need arises during the course of treatment. The planning & management of any blood bank depends on number of functions it is required to serve and the number of units of demand of blood & blood products. This has also changed the role of nursing from skilled nursing care to managing the blood bank services. Hence, there is a need for the nursing personnel to know about the recent advances in planning and management of transfusion medicine, so that they can handle this dual responsibility as a Nurse and a manager..

INTRODUCTION

Blood is the life line of human body, supplying oxygen & other nutritions. An adult human body has approximately 5 litres of blood. The blood content is reduced in a disease process, accident and surgery. Blood transfusion plays a vital role in providing support to the treatment procedure

In recent years blood transfusion services have become an integral part of the health care system. The primary objective planning for a blood bank is to ensure adequacy, accessibility and efficient supply of blood & its products in a safe, cost effective and coordinated manner. However before planning for a blood bank we should know, what is the

AUTHORS:

Dr. Shyama S. Nagarajan, Senior Resident, Deptt. of Hosp. Admn., AIIMS

Dr. Kabita Chatterji, CMO, Deptt. of Transfusion Medicine, AIIMS.

Mrs. Manju Nandi, Chief Nursing Officer, AIIMS

Dr. P.C. Chaubey, Addl. Prof., Deptt. of Hosp. Admn., AIIMS.

meaning of a blood bank today? What functions it is supposed to serve? And what is the work load?

A Blood Bank today is a place or organization or unit or institution or other arrangements made by such organization, unit or institution for carrying out all, or any of the operations for collection, apheresis, storage, processing & distribution of blood components.

ROLE OF NURSING IN MODERN BLOOD BANKING { In a Tertiary level Hospital }

FUNCTIONS OF BLOOD BANK TODAY:

The following are the functions of blood bank in modern medicine :

- Selection of donors (i.e.) to determine the suitability.
- Blood collection.
- Screening of blood for various blood borne diseases.
- Component preparation.
- Storage of blood & blood products.
- Record keeping of the above.
- Training of medical & paramedical staff.
- Research.

PLANNING CONSIDERATION:-

Planning of blood transfusion services depend mainly on the following factors-

1. Number of beds.
2. Whether it is a regional blood transfusion centre or not.
3. Type of surgery (handling trauma or not)
4. ICU cases.
5. Number of hematology and oncology patients.

The planning of present blood bank is for a tertiary hospital, which has a demand of more than 16 units of blood/ its components per bed per day.

PLANNING DETAILS

Following are the part of planning program of a blood transfusion centre-

Location of the blood bank, Space requirement, Functional and operational aspects, Staff for blood bank, Equipment, Waste disposal. Record keeping and Good manufacturing practices/ standard operating procedures.

1. Locations and surroundings:-

The blood bank shall be localized at a place which shall be away from open sewage, drain, public lavatory or similar unhygienic surroundings. The wall and floors of the room shall be smooth, washable and such, as can

be kept clean. The employees should be free from contagious or infectious diseases.

2. Space requirements- A blood bank requires a minimum of 100sq.mt. for its operation & an additional of 50sq.mt for component preparation. In a tertiary level Transfusion Services Department. A total area of 1000sq.mt should be allotted to serve the following functions

3. Functional & Operational Aspects:

Keeping in mind the various functions of a blood bank as mentioned before, the following designing details should be kept in mind:

1. Privacy & area for thorough examination of donors to determine their suitability as donors.
2. Collection of blood with minimal risk of contamination and exposure activities and equipment unrelated to blood collection.
3. Proper storage of blood & its components pending for completion of test.
4. Provision for quarantine (isolation) and storage of blood with its components, which earlier had a questionable serological results.
5. Provision for quarantine, storage and disposal of products and reagents not suitable for use. →

6. Storage of finished products prior to distribution.
7. Adequate and proper performance of procedure relating to Plasmapheresis, Platelepheresis, Leucopheresis.
8. Proper packing & labelling of finished products.
9. Provision of safe & sanitary disposal of blood, its components & trash.

4. Staffing of blood bank (personnel)-

Every blood bank shall have following categories of whole time competent technical staff:-

(a) **Medical officer** - A person adequately trained and experienced in transfusion services should head it, preferably a M.D. in Transfusion Medicine or Pathology. The person appointed should have the authority to organize, manage, collaborate and to ensure the fulfillment of safe blood transfusion services.

(b) **Trained technicians** in all areas of the work of the blood transfusion services along with technical supervisors where blood components are manufactured. He should have a Medical laboratory Technician (M.L.T.) degree with six months experience in testing blood / its components or Diploma in M.L.T. with one year experience.

(c) **Registered Nurses** – Bachelor in Nursing with one year experience in blood banking.

(d) Donor organiser/ Social worker.

(e) Clerical staff.

(f) Sanitary attendants/ Service staff.

(g) Driver.

5. List of Equipment in the blood bank:

All the essential equipments used in the blood bank for collection, processing, testing, storage and distribution should be available at the right place and time.

6. Waste Disposal:-

The waste generated in the blood bank has to be classified, segregated, collected & disposed as per the Bio Medical Waste Management (BMW) Rules, 1999. by the Ministry of Environment.

7. Record Keeping:

The record includes:

- 1) **Donors Record**- Blood donor, address and signature of donor with other particulars of age, weight, hemoglobin, blood grouping, blood pressure, medical examination, bag number and patient's details for whom donated, incase of replacement donation, category of donation and deferral records and signature of Medical Officer in charge.
- 2) **Master record** for blood and its components- It shall indicate bag serial number, date of collection, date of expiry, quantity in ml. ABO/Rh Group, results for testing of HIV I and HIV II antibodies. Malaria, VDRL, Hepatitis B surface antigen and irregular antibodies.
- 3) **Issue register**- It shall indicate serial number, date and time of issue, bag serial number, ABO/Rh Group, total quantity, name and address of the recipient, group of recipient, unit/institution, details of cross matching reports, indication for transfusion.
- 4) **Records of components supplied:-** quality supplied; compatibility report, details of recipient and signature of issuing person.
- 5) Records of bags
- 6) Register for diagnostic kits and reagents used.

8. Good Manufacturing Practices/ SOPs

The written Standard Operating Procedures shall inter alia include:

1. Criteria to be used to determine donor suitability.
2. Methods of performing donor qualifying test
3. Solutions & methods used to prepare the site of phlebotomy
4. Blood collection procedure, including in process precautions taken to measure accurately the quantity of blood drawn from the donor.
5. Methods of component preparation.
6. Pretransfusion testing, including precautions to be taken to identify accurately the recipient blood components during processing.

7. Procedures of managing adverse reactions in donor & recipient reactions.
8. Storage temperatures & methods of controlling storage temperatures for blood & its components & reagents.
9. Length of expiry dates, if any, assigned for all final products..
10. Criteria for determining whether returned blood is suitable for re-issue.
11. Quality control procedures for supplies & reagents employed in blood collection, processing & re- transfusion testing.
12. Schedules & procedures for equipment maintenance & calibration.
13. Labelling procedures to safe guard its mixups, receipt, issue, rejected & in-hand.
14. Procedures of plasmapheresis, plateletpheresis & leucopheresis if performed, including precautions to be taken to ensure re- infusion of donor's own cells (Autologous Transfusion).
15. Procedures for preparing recovered (salvaged) plasma if performed, including details of separation, pooling, labelling, storage & distribution.

Frozen blood is the newest concept in blood banking. It is needed in a tertiary level hospital because, Frozen RBC has a shelf life of one year. All parameters of blood cells is maintained for a year. In this case 4-5 days of old blood is generally frozen. it allows building a long term inventory of rare blood groups. Frozen cells can also be effectively stocked for military mobilization or for any civil disaster.

Viral inactivation is the process to inactivate the pathogenic organisms such as enveloped and non-enveloped viruses such as HIV-I, HIV-N, HBN surface antigen.

ROLE OF A NURSE

A Nurse has got a crucial and great role to play in blood bank which is an integral part of hospital and community. Her role can be classified under the following main four headings:-

Motivation, Psychological support, Assistance in blood collection and Health teaching guidance and Counselling.



MOTIVATION AND PSYCHOLOGICAL SUPPORT

A Nurse by her communication skills can motivate the people to donate blood. She can very well communicate the fact that giving blood is in no way harmful. The blood volume is replaced within 24 hrs. and that blood cells are regenerated after 3 months. After this a person can donate blood again.

PSYCHOLOGICAL SUPPORT

Donors who reach to blood bank for donating blood may have anxiety, fear and confusions. Some donate blood for their own relatives, they think if they do not donate blood surgery or treatment gets cancelled or, if they loose blood they may become prone to diseases. A Nurse at the blood bank services must anticipate all these stress of donors and handle the situation by giving proper need based health education to the donors.

A Nurse can give psychological support to donors by introducing them to a voluntary donor or she can allow the person to visit the blood collection unit. A Nurse must give reasonable answers to all his queries. This way she can convince the donor.

ASSISTANCE IN BLOOD COLLECTION

A Nurse can show her expertise in assisting in blood collection. She should know the criteria in selection of donor, preparation of the unit with necessary equipment, emergency life saving drugs, equipment for CPR, Oxygen supply, I.V. fluids.

CARE OF DONOR PRE AND POST BLOOD DONATION

- > She must ensure that all donors fill the screening questionnaire.
- > General appearance – healthy
- > Body weight minimum
 - 45 kg for 350 ml of blood
 - 55 kg for 450 ml of blood
- > Hb- 12.5 g %
- > Pulse 50-100 per minute regular
- > Blood pressure
 - systolic – 90 to 160 mm of Hg
 - diastolic- 50 to 90 mm of Hg

- > Skin over phlebotomy site healthy from lesions and needle marks.
- > selection of vein and cleaning arm; cleaning – 3 cm in all direction with savlon with 1% weak iodine 45%, betadine or methyle spirit

- > Donor phlebotomy
 - inspect the bags – anticoagulants must be clear
 - donor number on the bags and pilot tubes must be maintained correctly
 - position of bag carefully on the biomixer blood bag scale.

- During blood collection the client is to be watched for any adverse donor reaction

- > Mild reactions
 - giddiness, headache, sweating.This can be handled by talking with the client, and giving her refreshments (drinking water, fruit juices etc.)

- > Moderate reactions: Fainting, Hypotension, Vomiting, Hematoma-formation – ice pack., elevate the arm

- > severe reactions

- Conclusions

- Management – airway clearance, unconsciousness- airway clearance Cardiac arrest -CPR

HEALTH EDUCATION/GUIDELINES COUNSELLING

Health education is part and parcel of nursing profession and a Nurse must be trained to give health education wherever they are posted. So it is very much applied in blood bank services also. Following are the guidelines for health education in blood bank services:-

1. Who can donate blood?

- Any healthy adult between the age of 18 to 60 years can donate blood.

2. Who can not donate blood ?

- A person who is anaemic and is one who has a Hb of less than 12 dL, whose body weight is 45 kg.
- A person who suffered from Hepatitis B, Hepatitis C, AIDS and sexually transmitted diseases.
- A person who is addicted to narcotic drugs.

3. How often one can donate blood ?

- It is safe to donate blood every 3 months .

4. Is there any danger in donating blood?

- There is virtually no danger.
- Only healthy persons are encouraged.
- Only sterile disposable needles are to be used to collect blood to prevent transmission of diseases in the process of donating blood.

- Blood donation takes only a few minutes.

- The donor is made to rest and given refreshments after donation.

5. Before donation blood tests to be done ?

- The donation time is just 15 minutes.
- No need of medication and tonics after the donation.

- Within 24 hours the donated blood volume is replaced back.

- By donating blood you can save one's life.

- The chances of getting heart disease is reduced than those who do not donate blood, so it is useful to yourself.

CONCLUSION

The role of nursing personnel in various health fields can not be fully expressed in words. This stands true for the case of blood bank services also. The planning & organization of a Transfusion Medicine Department with dual responsibility of nursing manpower, as a manager as well as a skilled Nurse in the above lines, will lead us a long way in safe blood transfusion.

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