A STUDY OF BLOOD BANK SERVICES AT ALL INDIA INSTITUTE OF MEDICAL SCIENCES HOSPITAL, NEW DELHI

Thesis submitted to the faculty of All India Institute of Medical Sciences, in partial fulfilment of the requirements for the degree of Master of Hospital Administration.

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GUIDES:
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RECOMMENDATIONS

The study of the Blood Bank Services in A.I.I.M.S. hospital has revealed a number of problems in the Blood Bank which require attention; there is plenty of scope for improvement by resolving some of these problems.

On the basis of this study and analysis of the opinion expressed by the staff and the users the following recommendations are made to have better productivity and efficient functioning.

ACCOMODATION AND PHYSICAL FACILITY

The Blood Bank, present accommodation has been found to be inadequate for its work load. In view of limited scope of expansion of the Blood Bank in the present site and the need for the projected growth and modernisation as a long term measure a new Blood Bank complex needs to be though of. However, as a short term measure 38 sq. meter area available adjacent to the Blood Bank, after shifting of the hospital laboratory complex needs re-designing. This new area available can be well utilized by locating the component therapy wing of the Blood Bank for the time being.

PLANNING:

For a future prospective plan, the following points need consideration:

a) Reception Area: Casual visitors have no place in laboratory. Messengers with blood specimens should not be exposed to the working area and technologist should not be interrupted to receive specimens.
b) **Phlebotomy Area**: A special area should be set aside for bleeding donors, together with an examination room and a separate canteen, eating, smoking and drinking should not be allowed in the area, extraneous items of equipments should be excluded. The presence of centrifuge, refrigerators and fans is undesirable, because they tend to create aerosols. If the donor room open out upon an area where there is a great deal of activity and dust, windows should be kept closed. If windows are ever opened, they should be screened. There should be no dust catchers, such as exposed pipes, over the donor beds or chairs. The walls should be easily cleaned, peeling or flaking paint or plaster should not be tolerated.

c) **Shipping Area**: Blood shipment and blood collected or mobile units should be received, packed or unpacked in a separate area. Portable refrigerators, cartoons and other packing materials should not be allowed in the laboratory working area.

d) Laboratory should be a separate unit.

e) **Utility Area**: Pipette washers and dryers, pumps, ovens autoclaves, utility sinks, and other utility equipment should be located outside the laboratory proper.

f) **Storage Area**: Storage facility should be ample and readily accessible. There should be separate accommodations for blood or blood components, for supplies and equipment, and for record.

g) **Special housing for centrifuges and refrigerators**: As these equipment can create potentially dangerous aerosols, particularly likely with centrifuges, especially if container is over filled or if breakage occurs. So large centrifuge should be placed in a separate area with a exhaust fan.

h) Technicians needing small instruments in a laboratory should be placed in the laboratory table.

Further as refrigerator compressors are heat makers as well as a potential source of aerosols, it should be accessible to the working area but they are best housed outside it.

i) **Australia Antigen testing laboratory**: This ideally should be a separate lockable room which is used, only for this purpose. However, a simple cubicle screened from other laboratory activities is acceptable, provided it is clearly separate from the donor area. It may be equipped not only for Australia antigen testing but also for performing routine Serological tests on high risk specimening. It should have a separate refrigerator for opened regents and for specimens or units of blood positive for Australia antigen.
j) **Quarters for automated blood grouping:** - With current automated equipment for blood grouping, personal should be protected from the hazards inherent in the operation, and the equipment should be protected from the uniformed but curious passer-by. This room also can be used for instruments for automated anti-body detection.

k) **Hand-washing facilities:** - Utility sinks should not be used for this purpose, the wash basin should be equipped with and automatic soap dispenser and with taps that are possible with the elbows or with a foot treadle.

l) **Provision for personal comfort:** - Technologists are not allowed to smoke or eat in the work area or to place food in Blood Bank refrigerators. They also are required to wear protective clothing. It is unrealistic to expect strict compliance with these rules if their personal comfort and needs are disregarded, suitable and readily accessible locker, lunch room and lounge facilities should be provided.

In view of the above for maintenance of a minimum standard of efficiency, safety, work load and considering the day to day experience the following minimum space requirement is a must for A.I.I.M.S. Blood Bank.

1. Office for B.T.O./Asstt. B.T.O./Pool Officer One room 45 Sq.m(15Sq m per head)
2. Laboratory (Grouping cross Matching, or one big room Special tests) Three room 60 Sq.m
3. Washing & Sterilizing One room 30 Sq.m
4. Australia antigen Lab. One room 30 Sq.m
5. Washing & Sterilising For AU Lab. One room 30 Sq.m
6. Blood collection room or bleeding room for voluntary & relative donors. One room 30 Sq.m
7. Rest room One room 15 Sq.m
8. Donor canteen One room 20 Sq.m
9. Examination room One room 15 Sq.m
10. Professional Donors blood Collection and Rest room.

11. Office, records etc

12. Staff room

13. Store room

14. Miscellaneous

(toilets and Circulation area etc)

TOTAL: 450 Sq.m.

Besides, in view of future expansion and widening the scope of the Blood Bank for producing large scale blood components for which a deal of foreign aid is finalised for procurement of equipment, an additional space of 120 Sq.m. to be kept in view.

This additional space as indicated above proposed to be utilized as under:

1. Storage for blood component

2. Component therapy Room for OPD cases (this will avoid short Admission of cases in the Indoor beds & facilitated better utilization of hospital beds.)

3. Leukopheresis room

4. Lab for component Therapy

5. Store room for component therapy section (general)

6. Room for Officer-in-charge component therapy

TOTAL: 120 Sq.m
The following major equipment which are in the process of procurement will also be installed in these area, besides the various laboratory aids for the modernisation scheme.

1. Deep freeze - 1
2. FR 6000, refrigerated centrifuge - 1
3. Leukopheresis system (cell washer) - 1

AUGMENTATION OF BLOOD SUPPLY:

The Blood Bank has a short fall of 27 percent of its supply from voluntary and relative donors. Hence it has to resort to professional donors to meet the requirement of the hospital. It is recognised by the Blood Bank Officials as well as the users of blood, that for the sake of quality, the Blood Bank should do away with the professional donors.

The novel scheme of blood insurance introduced recently is aimed at that direction. It need to be persued vigorously. This scheme should also be extended to the general public.

The other scheme which may help in taping the vast resource of blood in the institute itself by observing voluntary blood donation camps. Observation of annual blood donation day may also help in the process. The involvement of staff and students in its organization is expected to give high dividend, and also incorporating the number of donation they give in the service book can further motivate them.

Blood Bank should link itself with various welfare societies and also the civil defence organization of the town and engage social workers from various part of the city to bring voluntary donors.

A blood donors ‘society can also be formed in association with other social welfare organization of the town to maintain a donor register and use the blood if and when required. However, all these efforts will need a organization supported by prominent public men and women and Blood Bank staff.

QUALITY CONTROL:

The Blood Bank is maintaining a high standard of quality control in spite of the limited staff available. To sustain this, adequate full time staff should be made available.

TECHNICAL SERVICES:

For maintenance of high quality service and up-dating the Blood Bank procedures, seminar, workshop etc. should be organised by involving the lower echelon of the technical staff.
The Blood Bank may consider dispensing of blood in smaller quality for the paediatric use, as desired by most of the paediatricians in the institute.

EQUIPMENT AND SUPPLIES:

To meet the additional work load and augment the facility for blood component preparation in a quantity that they could be supplied on a routine basis, equipment like, table top centrifuge, top pan balance, deep freeze with recorder alarm system are to be provided. Along with the equipment ancillary items like Blood Collection Bag of different types, single, double and triple bags are to be provided.

These items of standard quality are only manufactured outside the country. It is therefore proposed that a system of continuous and regular supply of these items are to be made, so that for want of these items the production of blood component does not get disrupted.

STAFF:

The inadequacy of staff compliment in the Blood Bank was found to be one of the major bottleneck for the modernization process. It is therefore felt that it is important to assess periodically the adequacy of staff, keeping in view the increase in workload and sophistication of the work technique.

Requirement of technicians should be done on the basis of their training and qualifications. There should be provision for their in service training and advance training for new methods and also promotion on the basis of their performance, so that they feel motivated to do good and more work.

To provide adequate service and implement the modernization scheme the following additional staff are proposed.

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<tr>
<th>Category</th>
<th>Existing</th>
<th>Input</th>
<th>Justification</th>
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</thead>
<tbody>
<tr>
<td>Staff</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Technician</td>
<td>14</td>
<td>4</td>
<td>1. To convert a tile method of grouping to tube method involves twice as much work.</td>
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<tr>
<td>2. To do a adequate cross-matching involving cooms or enzyme method involves approx.</td>
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four time as much work.

3. At present 2 technicians are each doing between 15-20 cross matching. 1 technician is doing all grouping by a tube technique. One technician will probably be able to do 5-7 cross matches. This would require 3 more technicians.

4. Nurse | 1 | 2

2. Supervising preparation of Blood collection sets.
4. To help with spot donation camps.

5. Social Worker nil | 1

1. To go to wards and O.T. etc. to recruit donors.
2. Answering all donor Queries before donation, And attending to them after donation.

6. Clerk | nil | 1

1. Maintaining donation Ledgers, stores indents, and its ledgers, typing etc.
2. Reports for Lab., e.g.
   Monthly yearly report
   Preparing patient bills, Vouchers for professional Donors.
3. Correspondance and other Typing work for Blood Bank
4. Attending to telephones.

7. Lab. Attdt. | 1 | 2

1. Washing all glass-ware Required for converting to tube test.
2. Washing blood collection Apparatus.
3. Assembling collection sets
4. Collecting sets and pre-
    pairing for spot donations.
5. Helping doctor on spot
    donation.

7. Sweeper ½ 1
   1. Cleaning entire Blood
       Bank which is proposed
       to be expanded.
   2. Blood donor room which
       is used throughout the
       Day has to be repeatedly
       cleaned and maintained.
   3. Discarding clotted sample
       from tubes so that these
       can be washed by the
       Laboratory attendant.

8. Nursing 3 1
   1. To past on night shift &
      orderly to help technician
      making and provision of tea
      for donors

IMPROVED COMMUNICATIONS:

Effective communication is proposed to be improved by means of staff meetings, staff
manual for the Blood Bank. All standardised procedure should be incorporated in the staff
manual. This should be periodically reviewed and brought up to-date.

In addition to the staff manual, publication of a Blood Bank Bulletin will go a long way
in bringing the communication gap between the clinicians and the Blood Bank, and also act as a
public relations organ of the Blood Bank, especially for voluntary blood donations.

SUMMARY INTRODUCTION:

The Blood Bank Service is an important area on which modern medical practice heavily
depends for the therapeutic services in a hospital. Management of patients of cancer, congenital
disturbances, burns, and sophisticated surgery like cardio-vascular and thoracic surgery is
possible today due to modern Blood Bank Service. For the Hospital Administration also it is an
important area, as the efficient use of Blood Bank Service will result in better patient care and
hence the community image of the hospital.

The Blood Bank Service of the All India Institute of Medical Sciences hospital was studied with
the following objective:
(i) To study the existing organization, staffing and physical facilities available in the Blood Bank of A.I.I.M.S. Hospital.

(ii) To study the existing practices and procedures in the Blood Bank to assess the functioning of the department.

(iii) To study the actual work load for various activities concerned with receiving, collecting, testing, storing, manufacturing, distribution of human blood and work out the future work load, on the basis of effective demand and supply.

(iv) Based on data collected above an attempt was made to co-relate the work load with the available resources in order to identify the areas where additional inputs or changes in the existing practices and procedures for efficient and effective functioning of the Blood Bank Services are needed.

METHODOLOGY:

The study was carried out in two parts:

1. Retrospective study, in which data was collected from the records relating to the quantum of services provided by the Blood Bank during the last 5 years.
2. Prospective study, in which data was collected about the existing organization, staffing, physical facilities, assessment or need and demand, procedures of work and other problems of the Blood Bank related to the functionaries and consumers, both clinicians and the general public.

The methods followed are:

a. Examining the standing orders, instruction, rules and regulation.
b. Assessment of the physical facilities in Blood Bank by observation and interview.
c. Direct observation on the working methods and work study techniques.
d. Interview and discussions with the staff members working in the Blood Bank.
e. The opinions and suggestions of the consumers by questionnaire and interview.
f. Random sample of public opinion was obtained by an interview schedule.
g. Activity sampling was carried out to investigate the type of activity done by the technical staff.
h. Statistical interpolation method was applied to project the anticipated work load.
i. The data generated about the work load were objectively related to the resources available and based on the findings recommendations were drawn.

**OBSERVATIONS:**

The A.I.I.M.S. Blood Bank is the foremost Blood Bank in Delhi in terms of number of blood units collected and issued. It has incorporated almost all the functions of a modern Blood Bank in an advanced country, like modern techniques of grouping, routine Australia antigen test, blood component preparation and patient therapy service.

It has succeeded in reducing the number of professional donors to 27 percent of the total collection from 82 percent. The quality control of the services is maintained to be of high order and transfusion’s reaction are almost nil in the hospital.

Hospital utilised 7405 units of blood during 1974-75 and it has increased by 51 percent during last 5 years. In the year 1978-79, 11202 units of blood were issued to the hospital. The yearly increase of blood issued is average 10 percent.

The need and utilization of blood in the hospital is .5 units per inpatient admission on an average and average 1 unit of blood is required for each major surgery. This rates very high even compared to the developed countries, where the need of blood is increasing at the rate of 12 percent per annum.

The quantum of work load in terms of number of blood units collected and used has increased almost double during last five years. Introduction of improved methods and new tests has resulted a high quality service of the Blood Bank but the same time there is many fold increase of work load.

The adequacy of technical manpower for the present work load and methods is found to be insufficient and there is a shortfall of two technical hands in the Blood Bank. The physical facilities especially space is found to be far too inadequate for the present level of work. The modernisation process is hindered for lack of expansion facilities in terms of space, and man power development.

The blood component preparation initiated in A.I.I.M.S. Blood Bank has set in the economic method of use of blood and for the clinical perfection. It is being further augmented. Thus the A.I.I.M.S. Blood Bank is growing fast in terms of quality and quantity of service along with the expansion of the hospital and the technological development in the field. However, for its future projected growth, a long term and short term plan is needed specially for physical facilities and man power development.
CONCLUSIONS

The Blood Bank Services in the All India Institute of Medical Sciences, as it exist at present, have been studied in terms of the managerial functions (Planning, Organization, Staffing, Directing, and Controlling) to analyse the deficiencies so that the services can be made more efficient and effective towards attainment of hospital goals. The increasing dependents of modern medical practice on Blood Bank Services and the sophistication of medical procedures make it imperative that the services are reviewed and up dated in terms of resources and technological advancement.

This study is, by no means, exhaustive. There is scope for further study in many areas such as evolving a comparable method for measurement of blood bank techniques, estimation of need and demand of blood, cost benefit analysis for blood component preparation, to mention a few. It is hoped that the observations and findings of the study will be found useful for similar managerial studies of Blood Bank Services in a large teaching hospital.