

Informatics in blood banking

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Abstract

Blood Bank is regulated under the Drug and the Cosmetic Act 1940 and the rules framed there under, 1945.¹ As per SCH.F. pt. XII-BL Records a complete and a meticulous records have to be maintained. Which include iner alia the following particulars namely. Blood donor records, Master records for blood and its components. Issue register Records of A.C.D./C.P.D./CPD-A/SAGM bags Register for diagnostic kits and reagents used, Transfusion adverse reaction records, Records for purchase, use and stock in hand off disposable needles syringes, blood bags, of expiry and date or use. To efficiently handle the emergency and flawless routine working the blood bank has to maintain a number of internal records within each lab. To maintain so much of records correctly is an enormous task and require many dedicated technician and still leaving a possibility of human error. Even a slightest mistake can cost to the life of a patient, depletion of rare blood from the stocks, which may create havoc in the emergency, and blood being expired without being used. All these reasons make the records keeping a very important task in the blood bank. This create a need for computerization of the blood bank and developing software so that the entries made at one desk are reflected to the other persons in chain making entries. If by any chance the entry made at one desk if is not matching with the other entries it will be automatically reflected and the software would not accept two different types of entries for the same sample/blood bag. The software also require to maintain the integrity and confidentiality of the blood bank, therefore it require that the entries at some point made may be available to the some specific pre marked concerned computers and not to all. This spares the trained technician to perform the more technical job with more concentration. It further makes the system transparent and adds to the satisfaction of the patients, and the treating clinicians

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INTRODUCTION

Blood Bank is regulated under the Drug and the Cosmetic Act 1940¹ and the rules framed there under, 1945 which require meticulous record maintenance. To maintain so much of records correctly is an enormous task and require many dedicated technician. And leaving a possibility of human error which can lead to emergency situation for patient and blood bank. This create an urgent need for computerization and developing software so that the entries made at one desk are reflected to the other persons in chain making entries with inbuilt check points.

AIMS AND OBJECTIVE

To Assess the need of computerization of blood bank. Formulate a design of computerization for meticulous maintenance of record.

MATERIALS AND METHODS

The study was conducted at Safdarjung Hospital blood bank. The various technical details and records were referred to analyze the requirements of blood bank:

OBSERVATIONS AND RESULTS

As per the study it was observed that Blood bank is regulated under the drug and the Cosmetic Act 1940 and rules framed there under, 1945. As per SCH.F. pt. XII-BL A complete and a meticulous records have to be maintained. Which include iner alia the following particulars namely

Blood donor record: It shall indicate serial number, date of bleeding, name, address and signature of the donor with other particulars of age, weight, hemoglobin, blood pressure medical examination, bag number and patient details for who donated in case of replacement donation, category of donation (voluntary / replacement) and deferral records and the signature of the medical officer in charge.

Master records: for blood and its component: it shall indicate bag serial number, date of collection, date of expiry, quantity in ml., ABO/ Rh group, result of testing of HIV I and HIV II antibodies, malaria V.D.R.L., Hepatitis B surface antigen and Hepatitis C virus

antibodies and irregular antibodies if any name and address of the donor with particulars, utilization issue number, components prepared or discarded and the signature of the medical officer in charge.

Issue register: It shall indicate serial number, date and time of issue, bag serial number, ABO/Rh group, total quantity in ml., name and address of the recipient, group of recipient, unite/ institution, details of the cross matching report, indication for transfusion.

Records of A.C.D./C.P.D./CPD-A/SAGMbags: Giving details of manufacturer, batch number, date of expiry and date of use.

Register for the diagnostic kits and reagents used: Name of the kits /reagents, details of the batch number, date of expiry and date of use.

Blood bank must issue the cross matching report of the blood to the patient together with the blood unite.

Transfusion adverse reaction records

Records for purchase, use and stock in handoff disposable needles syringes, blood bags, date of expiry and of use

The environment in blood bank is always lively. Emergency arising in any division of hospital pumps pressure to blood bank and the technician /doctors are always on toes fighting together with the rest of the hospital for the life of patient. To efficiently handle the situation most of the blood bank maintain separate records as life saving and to the pediatrics unite. Besides that for the smooth and flawless routine working the blood bank has to maintain a number of internal records within each lab for example, In donation hall records are to maintained for items like, donor form, donor card, blood collection bags (including used discarded given in the ward.) refreshment indented consumed handed over the next person on duty.

The lab responsible for issuing blood (issue lab) maintains its records of cross matching done, the amount of blood present in the lab, (both the cross matched) and ready for use to patient and the stock position available in lab. besides that the stock position of the lab has to be updated the date and time wise and as the need arises further blood has to be requested from the main blood bank. Many a time this also requires a change at the surgery gas to be pre or postponed to be arranged in emergency and the requirement of the blood is not always as predicted. All this requires a very meticulous and attentive management.

The lab screening the donor has to do hemoglobin and blood grouping and to maintain the records of the same.

The blood once collected in the donor bags is again grouped and carefully labeled. Sometimes the weak and the mixed antigen prove to be a challenge to the technician once the group is confirmed the sonar bags are labeled according to the norms of the drug and the

cosmetic rules 1945 which is as under A color label has to be put on every bag on containing blood. The following color scheme for the said label has to be used for different group of the blood:

The lab screening the blood for hepatitis B surface antigen, hepatitis C virus antibodies, syphilis, freedom from HIV I and HIV II antibodies and malaria parasite has to maintain the record of each investigation and also the complete record of each blood bag status. The infected blood has to discard and for this besides the investigation result register a discard and the clearance register has to be maintained, to be sure that the blood is preserved in the best suitable environment and not deteriorated.

The blood storing unites have to very meticulously maintain the record of the blood present of each group date and group wise and wisely supply to issue lab this is very important for efficient utilization of the blood and preventing the chance of the blood being expired. Besides that the temperature records have also to be maintained.

To regular the flow of free blood given for the patient in dire emergency generally in most of the hospitals there is a system of issuing a life saving free blood by some specialist or the in charge of the blood bank (Officer L). in the big blood bank there are 3 to 4 persons authorized to issue free blood. To maintain the coordination among the persons authorized to sanction, the stock position and the patient requesting for free blood is a difficult task. A little discoordination may result in depletion of rare blood stock. At present generally in blood banks the In-charge is informed about the stock position in the morning. Now consider a situation where a person can carry three requests for one patient to three different Officers and manage to get three sanctions for the same patient.

Preparation and sanction of the blood components also require the same set of record.

The blood bank also receives blood from different blood banks of other hospital, NGO,s etc. These are also to be recorded and stored as per norms of the drug and cosmetic Act 1940.

To maintain so much of record correctly is an enormous task and require many dedicated technicians, which consumes many hours of human man power and still leaves a room for human error. Even a slightest error can cost to the life of a patient. a mismanaged record to lead to depletion of any blood group and blood being expired without being used. This creates a need for computerization of the blood bank and developing software so that entries made at one desk may be reflected partially or fully at other desk depending on the use and as per the requirement of maintaining the integrity and confidentiality. Internationally many software are available one of them is SAD_BaSe.²

Table 1

Sr. No.	Blood group	Color of label
1.	O	Blue
2.	A	yellow
3.	B	Pink
4.	AB	White

RESULT

Details of the working of the lab with computerization as per the requirement of 2000 bedded hospital has been evaluated and a working model is prepared. The donor will visit the reception with a request from the doctor for donation form 1. This form may be directly displaced on the reception if the computer of the wards are licensed. The request will be in the prescribed format which will include the name, address of the donor along with other details. The receptionist will scrutinize the form 1 and will fill the donor form2 electronically and a donor number is allotted. The donor form is given to the donor. with this donor form the donor enters the initial screening room where his details are already on commuter screen and he is screened as per the drug and cosmetic Act 1945. After initial screening the technician will perform the blood group and haemoglobin and enter the same in computer. Depending on the information the doctor will allow the donor to donate the blood or differ if not found suitable Blood donors are deferred for various reasons. Individuals disqualified from donating blood are known as “deferred” donors³. Bahadur S Pujani states that blood donor suitability criteria are based on science, informed medical opinion, and regulatory rules.⁴. At this point a deferral number and form will be generated which will give the reason of deferral as per rule. The donor declared fit will accordingly move to the donation hall and the donor declared unfit will move to the consultation room where doctor will assess whether any other donor is available or the patient has to be issued a live saving blood. The computer and the printer of the donation hall will generate a label bearing the name of the donor, donor number and whether he is a voluntary or the replacement donor. The doctor in charge of the donation hall will check the donor number and the number present on the form available with the donor. The label will be put on the blood bag and at the end of the procedure will record in computer the condition of the donor at the end of the procedure and the refreshment given. Once the refreshment entry is made the donor card is generated induplicate. The donor card will have unique number, address, and name of donor. One donor card will be given to the donor and other will be stuck on the donor form1. The blood for viral markers. bags collected will be stored in a working cooler till they are tested. The blood bag donor number will be entered in the store computer. The

tubes of each bag are send for blood grouping and for screening of infectious disease. Any bag found positive for any viral markers will be labelled black and segregated by technician for discarding. The blood reported clear will go to cooler no 2. The stock position date wise and the consolidated one will be displayed on the screen of the store keeper. When a request comes to an officer for issue of blood the officer will make entry in computer which will be displayed to the store keeper computer. It will also reflect the stock position and the balance stock left. The computer will also show the position of the blood, expiry etc. The issue lab computer will display the position of the blood bags and update when blood is issued.

DISCUSSION

In blood BANK

1. Documenting and maintenance of records is an important aspect of Blood Bank and is mandatory and statutory requirement.
2. There is Duplication of same data at many stations which consumes 35%40% of working hours of employee
3. Delay in generating monthly and administrative reports
4. Difficulty in procuring data from old records
5. Problems of omissions and duplication.

The above issues can be solved to a great extent by using information system in the Blood Bank. Indian parliament adopted a ‘National Blood Policy’ in 2002, which clearly says in objective 3, strategy 3.5 that use of automation shall be encouraged to manage higher workload with increased efficiency⁵.

CONCLUSIONS

The computerization of the blood banks will increase the efficacy and transparency in management.

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