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Ext GRO-C

Dr L A D Tovey
Medical Director/General Manager
Yorkshire Regional Blood Transfusion Centre
Bridle Path
LEEDS
LS15 7TW

340/538/H

August 1988

Dear Dr Tovey

VISIT BY MEDICINES INSPECTORATE 29, 30 JUNE, 1 JULY 1988

May I thank you and your staff for the courtesy and co-operation shown to me during my visit to Yorkshire RTC.

Enclosed is a copy of my draft report and I would be grateful if you would comment on any errors in its factual content before I finalise it.

Yours sincerely

DR M L KAVANAGH
Principal Medicines
Inspector (Biologicals)

cc RH Hanley - MB 5B
Dr H. Prickett - MEO SEB
Dr R Moore - HSIA
C.A file for info only. Defect file (Mr Jessey)

GRO-C 28/9/88

NB. I have contacted the RTC and asked for an urgent response GRO-C 25/9/88

DRAFT

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Yorkshire Regional Blood Transfusion Centre
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1. INTRODUCTION

The Yorkshire RTC in Leeds is located in the grounds of Seacroft Hospital. Part of the Centre is a new building opened in 1986 (Phase 1) and a new donor centre opened in June 1988. The Centre has not previously been formally inspected.

The population served is 3.2 million, taking in 24 hospitals including two private hospitals. The Centre employs approximately 350 staff in total and collects around 150,000 donations annually.

2. SCOPE

The inspection covered the manufacture and control of the products listed in Section 4. Clinical matters, eg clinical apheresis, tissue typing and testing related to patients, were not included.

3. SENIOR STAFF LIST

Dr L A D Tovey	Medical Director/General Manager
Dr A E Robinson	Assistant General Manager
Mr S Barret	Donor Services Manager
Mr M Pepper	Scientific Services Manager
Mr A Heywood	Business Services Manager
Mrs P Mosely	Senior Nursing Advisor
Mr P Learoyd	Clinical Laboratory Manager
Mr E Lee	Chief MLSO - Blood Products
Mrs B Keyworth	Chief MLSO - Donor Testing
Mr S Ramskill	Chief MLSO - Microbiology
Mr D Molyneux	Chief MLSO - Blood Bank/Despatch

4. LIST OF MEDICINAL PRODUCTS

Whole blood
Platelet concentrates
Cryoprecipitate
Fresh Frozen Plasma
5 litre Plasma Pools
SAG-M Red Cells
Concentrated Red Cells
Filtered Red Cells
Dextran-sedimented Red Cells
Saline-washed frozen Red Cells

5. INSPECTION

5.1 Blood Collection and Receipt

Visits were made to two donor sessions, a static session in the Centre and a mobile session in Cleckheaton. The procedures are basically the same for both and will change when the full computerisation programme is completed (scheduled for September 1988; see Section 6).

The donor centre in the RTC is equipped with six plasma beds (Hemonetics Ultralight portable machines) and two bleed beds. Most donors are called in and at present their records are held on cards. New donors have a preliminary grouping while the haemoglobin assay is being performed and the details are entered onto a buff-card.

Haemoglobin-screening is carried out using the copper sulphate method. The limits are 125g/litre for females and 135g/litre for males. If a donor fails the copper sulphate test, then a repeat assay is performed using a Clandon Hemocue machine, which is checked daily using the standard supplied with the machine. (Approximately 50% of donors who fail the copper sulphate test pass the machine test.)

Donors are booked in onto a "bank sheet" and a set of six bar-code labels is issued. The bar-code number is written onto the bank sheet, as is the group. One label is stuck onto the record card and the remainder are attached to the blood bags and sample tubes. Excess bar-code labels are kept in a bag at the back of the donor attendant's workbox in case a further sample is required. By the end of the session, two or three differently-coded labels may be held in this bag.

Two samples are taken with each donation, one anticoagulated and one dry. In the case of plasmapheresis donors, a full blood-count sample is taken with the first donation and subsequently with every fourth donation.

Lignocaine (Phoenix) in a multiple vial is used as a local anaesthetic prior to venepuncture. When a syringe has been charged with anaesthetic, it is removed and a fresh, sterile needle is applied to the syringe. The needle remaining in the vial then has a new, sterile syringe attached to it. The batch number of the Lignocaine is not recorded.

When donations are completed, the packs are taken to the "technician area", together with the samples and record cards, where they are stripped and double-sealed and packed in crates. These are collected by a driver at mobile sessions or are delivered by session staff (static sessions) to the Blood Products Department (day time) or to Despatch/Reception (evenings). The "Bank Sheets", which cover an entire day's donations (ie morning and afternoon sessions) go to the Despatch department at the end of the day.

A set of SOPs for session procedures is contained in the "Procedures Manual" and each donor attendant receives a set of instructional documents. Training Logs for donor attendants are to be introduced.

5.2. Blood Products

Blood from sessions is delivered during the day direct to the Blood Products department, along with the donor cards and clotted samples. Blood from evening sessions is delivered to the Despatch doorway and is put in the fridge by the porter, while the driver puts the record cards in a box in Blood Products. The following day the cards and "white slips" (identifying an established donor whose record was not available at the session) are sorted into numerical order and information concerning unusual donations is transcribed onto a "Donor Testing Day Sheet" and a "Holding/Bank Checking Sheet".

The Blood Products department contains three main areas, (i) the general area for closed-system processing; (ii) a plasma-pooling room; and (iii) an area known as "the sterile area", where open-processing is performed (mainly the production of leucocyte-depleted red cell preparations).

The closed-system processing area is equipped with nine Heraeus Christ 12-bag pre-programmable Centrifuges plus two 6-bag types. At the time of inspection, the laboratory was untidy and dirty, with cardboard boxes (including one containing Christmas decorations) stacked on and under benches. There were pools of dirty water on the floor, apparently caused by condensation on the drain-pipe of a cold-bath, the windows were open and several flies were in the room.

During the preparation of SAG-M Red Cells, the optimal additive solution is drained back onto the red cells by hanging the packs up on racks. The height of the racks is such that the pack side-tubes dangle onto the wet, dirty floor. If there has been red cell spillage into the plasma (due to the application of excess pressure), the plasma is drained back into the primary pack (for re-spinning) by hanging it on the door handle of a fridge which is even lower than the racks. Again, part of the packs rest on the floor.

The procedure for separating plasma calls for centrifugation at 4°C (the P3 cycle on the centrifuges). At the time of inspection, three centrifuges running this cycle were indicating temperatures of 15°C, 19°C and 9°C respectively. This was said to be because they had previously been used to prepare platelets by spinning at 22°C. A pre-cool spin cycle of 1000 rpm at 4°C for five minutes had not been used.

Some SOPs are available for procedures used in Blood Products but they are incomplete, are not signed and dated and carry many alterations. A number of hand-written, unauthorized instructional notices are pinned to walls and shelving.

Platelets (five day expiry) are prepared in the afternoon from donations collected in the morning. "White Slip" donors (ie both walk-in established donors and new donors) are not excluded. A "Platelet Hold" book lists all the platelets which have been made; the test results are brought here and the platelets cleared for issue, at which time the platelet hold sheets are transferred to the platelet despatch book and checked off.

Plasma pooling is performed in an ordinary, open laboratory under Microflow LAF cabinets by staff wearing clean (non-sterile) paper gowns and gloves. The LAF cabinets have not been checked since their installation, about two years ago. There is no environmental monitoring of the cabinets or of the general environment. Instructions attached to each LAF cabinet specify that all doors and windows should be shut before using them; at the time of inspection, although cabinets were in use and pooling was occurring, the laboratory doors were wedged open and a blue-bottle was flying around.

All open-processing other than plasma pooling takes place in a separate room labelled the "sterile area". The processes performed here are (i) the preparation of filtered red cells (about 1200 units per year); (ii) the preparation of dextran-sedimented red cells (between 400 and 500 units per year); (iii) the preparation of frozen red cells (by mixing them with glycerol supplied by PFC, Edinburgh); and (iv) the washing of thawed red cells.

The most open process is the dextran-sedimentation technique, during which blood is transferred from the donor pack into two "Dextran" bottles and then into the final collection pack. The whole procedure takes a little over two hours.

Although called the sterile area, this is a total misnomer. The room serves as a store-room and contains a great many cardboard boxes in addition to a filing cabinet and a general "office area". The doors are often kept open (it is said to get too hot) and staff are free to enter wearing ordinary laboratory clothing, even when processing is taking place. Air into the room is not filtered, just cooled.

If the Centre's own autoclave is not in use (as was the case at the time of inspection - see Section 5.5), then material is autoclaved at Killingbeck Hospital. Sterilised sets of needles and tubing (Dextran Sedimentation Sets) were being stored in metal crates on the floor under the LAF cabinet together with assorted other odds and ends such as old bungs etc. Such autoclaved sets had been there for as long as eight weeks.

The open-processing is performed in two Microflow LAF cabinets which were installed some two years previously and have not been checked since. There is no programme of environmental monitoring and no SOP for cleaning the cabinets. The tops of the LAF cabinets were covered with a layer of dust.

The gloves and gowns worn by staff during the processing are not sterile and masks and head-covers are not worn.

The changing room and step-over area is totally mis-used, both sides of the step-over currently being used as storage areas. The plasma pooling and open-processing areas are supposed to be at positive pressure relative to the surrounding areas but the wall manometers are never checked and the required specification was not available at the time of inspection.

5.3. Donor Testing Laboratory

The laboratory is equipped with three Technicon 16C Autogroupers. Samples are collected from the coldroom and checked against the donor bleed sheets. Following centrifugation, the samples are loaded onto the machines in session. New donors are grouped by machine only since they have been ABO grouped and assigned as Rh+ve at the session. If the machine gives a new donor as Rh-ve, this is confirmed manually. Known controls are run through the machine each morning.

At present, results are printed out onto hard-copy and also on a floppy disc. The hard-copy is transferred to Blood Products, who retain it. Results are given to Bank Checking on floppy disc, where it is transferred to another. The samples are retained for two days on a separate shelf in the sample cold-room before being discarded.

Sera for use in the laboratory are stored in a fridge which has a circular chart recorder for monitoring the temperature. Each chart lasts one week but it had not been changed for seven weeks.

Junior members of staff have a Training Manual which covers all aspects of all departments and is filled in and signed as the required standard is achieved.

5.4 Microbiology

Samples are tested here for HBsAg (BPL-RIA), HIV antibody (Wellcozyme ELISA) and Syphilis (TPHA, modified Fujiribio). Selected donations are also screened for tetanus antibody, CMV antibody and HBs antibody. Platelets for urgent issue are sometimes tested for HBsAg by a rapid reverse passive haemagglutination method (Serodio by MAST Laboratories) which is less sensitive than the standard method (10-20 ng/ml as against 0.5 ng/ml).

The (clotted) samples are initially sorted in the Donor Testing laboratory where they are arranged (by Microbiology staff) into racks in microtitre-plate order, with blank tubes for controls, and are given Microbiology Numbers. There is a double-check that the numbers are correct and that the samples are laid out correctly.

370 Pl of serum is pipetted from each sample tube into a microtitre well. As each tube is sampled it is moved into a second rack. The microtitre plates are supposed to be labelled with the date and the number of the first sample on the plate as, after they have been sub-sampled, these plates are frozen and constitute the microbiology stored samples. (They are kept for two years.) In fact, several plates only carry the date.

HBsAg tests are read in a Berthold gamma counter and the cut-off is taken as the mean of eight negative controls plus 40 counts, as the machine reports counts automatically corrected for background. The print-outs of the results are stored in a over-flowing box on the floor.

For HIV antibody testing, three cut-offs and one positive control are included on every plate and the results are calculated against the mean cut-off plus 10%. The HIV read-out of results is non-computerised and just prints out a list of OD values. A re-read is then performed based on a calculated range. At the end of every run, a low positive control (supplied by CPHL, Colindale) is included.

If samples give repeat positive microbiology results, then the original samples are collected from Donor Testing (both clotted and anticoagulated) and the Session Sheet is marked "Hold-Microbiology". The main bag is labelled with a "Biohazard" sticker and is taken to Blood Products who remove all associated products and destroy them. The main bag returns to Microbiology, where a side-tube sample is taken and all four samples (ie plate, clotted sample, anticoagulated sample and side-tube sample) are re-tested.

If these repeats prove to be negative, the bag is destroyed anyway and the donor record card is flaggered "Bleed for serum and check with lab", ie the next donation is not used. If the tests repeat positive, then samples are sent to the local Public Health Laboratory and, for HIV antibody, to CPHL, Colindale. The record cards are referred to the Medical Director.

Results of the Microbiology tests are recorded as negative by means of a stamp on the session sheet, which goes down to Blood Products and eventually returns to Microbiology for filing.

5.5 Haematology/Quality Control

There is at present no Quality Assurance department although a room has been identified which it is planned to convert into a QA Laboratory. A draft job description for a QA Manager has been drawn up. Currently there is some QC performed on blood products in the Haematology laboratory. Samples are not, however, removed specifically for testing but are tested when they become available, eg on expired platelets.

Between 1 and 3% of platelet packs are tested and they are checked for platelet count, volume, pH, sterility and, usually, red and white cell counts. Factor VIII:C assays are performed on cryoprecipitate (7-10%) and FFP (1%) using a manual two-stage assay.

Leucocyte-depleted red cell products are tested for haematocrit, white cell and platelet counts and sterility. The pigtails from these products are routinely delivered to Haematology where a random selection (20-40%) are tested. Sterility testing is done using a blood agar technique developed partly in collaboration with the PHLS and involves a 24 hour incubation at 37°C.

There are no specifications applied to blood products but the QC test results are kept in a log-book. At the end of each month, a graph is drawn and a report is circulated listing results, ranges, and means with one standard deviation. Meetings to discuss these reports are attended by the Haematology and Blood Products Section Heads and the Clinical Laboratory Manager but no records are kept of the discussions and decisions.

The autoclave at the Centre is a Dent and Hellyer and at the time of inspection it had been out of use for two months due to a problem with the recorder. When functioning, it was used for autoclaving Dextran Sedimentation sets for use in open-processing. These are presently being sterilised in the Sterile Solutions Department of Killingbeck Hospital.

The autoclave is housed in a small, filthy room, made worse by the fact that the machine was under repair. The autoclave has only one recording probe (sited in the drain) which is validated monthly by the Engineering department of Seacroft Hospital. Records of previous autoclave runs are stored in a heap in a cardboard bin. Many of them were incorrectly completed.

5.6. Blood Bank and Issue

Donor Testing laboratory deliver the floppy disc carrying their results and Blood Products deliver the Session Sheets and record cards. A sheet is made out for Donor Testing which goes through Microbiology and Blood Products and is up-dated with information on discards, hold etc. Meanwhile, the floppy disc is loaded and the grouping results are verified against a menu card. The file is then modified to take account of the information on the up-dated sheet. The modified file is double-checked by the same operator.

Blood is collected from the quarantine cold-room and the packs are wanded against the modified file. The programme lists any packs that have not been verified so that missed packs can be picked up. The fridge in the Bank Checking area was found to contain special blood for issue on the same shelf as discard blood.

An Issue Sheet is printed out from the file and the blood is removed from the Holding Cold Room, sorted and put into the Issue Cold Room. All the cold-rooms are on an alarm system. Platelets are stored in an open area which is not temperature controlled. At the time of inspection, the temperature in the area was 26°C. Platelets under test are stored along with platelets for issue but on a separate shelf, although this is not clearly marked.

Orders for blood and products are always telephoned and are recorded on a telephone order sheet. The order is then put together by Despatch staff and wanded through, which produces a three-copy issue voucher. This is signed by the person issuing the blood and one copy is returned signed by the receiving hospital. The issues are logged into a book and hospital returns are logged into a book in the driver's van.

Orders for platelets during normal working hours are taken to Blood Products, who issue the packs; out-of-hours, the Despatch Book is transferred to the Despatch department.

6. FUTURE PLANNED CHANGES/DEVELOPMENTS

The major imminent development is the complete computerisation of the system, right through from donor records to product issue. This system has been running successfully for some years at the Welsh Regional Transfusion Centre in Cardiff and the Yorkshire system has been installed in close collaboration with their Cardiff colleagues. It is planned to "go live" in September 1988.

Among other improvements, the system will do away with the labelling of bags with groups labels at sessions and the grouping of new donors at sessions. Donor Testing will get a direct comparison with existing donor records and there will be a direct in-put of results to the one main-frame computer , thus obviating the need to transfer floppy discs. Stock control and issue of all products (including BPL and commercial products) will be under computer control.

The other planned change is the establishment of a Quality Assurance department. A room which could be come a QA laboratory has been identified and a job description for a QA Manager has been drafted.

7. MATTERS OF CONCERN

7.1. Donor Sessions

(a) Excess bar-code labels are not immediately destroyed but are kept in a bag behind each work-box in case a further sample is required. Several different labels may be present in this bag by the end of the session.

(b) The spring-balances (and the new trial mixing/weighing machine) are not regularly checked.

(c) The batch number of the Lignocaine used is not recorded.

7.2 Blood Products

(a) The laboratory for closed-system processing is dirty and cluttered with cardboard boxes and other unnecessary items. The floor has permanent pools of dirty water and windows are open, allowing the ingress of insects.

(b) The racks used for draining SAG-M solution onto red cells are too low, allowing the packs to trail on the floor. An even lower fridge-door handle is also used for this purpose.

(c) The separation of plasma by centrifugation is specified as a 4°C spin (P3 cycle); at the time of inspection, this was being done in three centrifuges at 19°C, 15°C and 9°C respectively.

(d) Some SOPs are available but they do not carry authorizing signatures and are much-altered. A large number of hand-written, unauthorized instructional notices are stuck on walls and shelves.

(e) Plasma pooling is performed in LAF cabinets which have not been checked for two years. Instructions on each cabinet specify that all doors should be closed before processing begins. At the time of inspection, the laboratory doors were wedged open although the cabinets were in use. There is no environmental monitoring.

(f) Open-processing of red cells is performed in an unacceptable room. Although labelled as a sterile area it is in effect a general laboratory containing stacks of boxes and a writing area with a filing cabinet. Staff are free to enter and leave wearing ordinary laboratory clothing, even when processing is taking place. The air into the room is not filtered and the doors are often wedged open. Open processing procedures are performed in LAF cabinets which have not been checked since their installation about two years ago. Staff carrying out open-processing wear gowns and gloves which are not sterile; masks and headcovers are not worn. There is no environmental monitoring. Air pressure specifications are not known and not checked.

(g) Platelets are stored in an open area which is not temperature-controlled. (During the inspection, the temperature in the area was as high as 26°C.) The dedicated shelf for storing platelets under test is not clearly marked as such.

7.3 Microbiology

(a) Microtitre plates containing the frozen, stored microbiology serum samples do not all carry the number of the first sample on the plate, as is required by the SOP.

(b) Print-outs of the results of HBsAg and HIV antibody tests are stored in overflowing boxes on the floor.

7.4 Donor Testing

(a) The weekly temperature recording chart on the fridge where reagent sera are stored had not been changed for seven weeks.

7.5 Haematology/Quality Control

(a) Although Quality Control testing of end-products is taking place, little use is made of the information; there are no specifications or targets and the monthly QC meetings are not minuted.

(b) There is no environmental monitoring of process areas or LAF cabinets and no QC/QA monitoring of storage conditions or documentation.

(c) The autoclave is housed in a filthy room and has only one recording probe. Records of previous autoclave runs were not filled in and are stored heaped in a cardboard bin. (The autoclave was out of action at the time of inspection.)

7.6 Blood Bank and Issue

(a) The fridge in the Bank Checking area contains special blood for issue alongside discard blood.

8. POST-INSPECTION SUMMARY

The summary session was attended by Dr Tovey, Dr Robinson, Mr Barret, Mr Pepper and Mrs Mosely. The inspector welcomed the imminent completion of the computerisation programme and the introduction of the Training Manual for junior staff. The deficiencies noted above (Section 7) were listed and discussed.

9. CONCLUSIONS

1. There should be a review of all open-processing with a view to eliminating unnecessary procedures. Essential open-processing should only be performed under suitable clean-room conditions following appropriate procedures. The manner in which such processes are currently carried out is unacceptable.

2. An adequately-staffed Quality Assurance section should be set up as a matter of urgency to co-ordinate existing Quality Control work and to implement a complete programme of Quality Assurance.

3. The cleaning procedures, particularly in the Blood Products department, should be reviewed.