O. [illegible]

Our Ref. 93285/19/1B

Your Ref.

MINISTRY OF HEALTH,
WHITEHALL, LONDON, S.W.1.

13th August, 1946.

Dear Aubert,

I enclose drafts which have been approved by Sir Wilson Jameson and Sir Philip Panton, outlining policy on:-

1. Medical Examination of Donors
2. Medical Care of Donors
3. Stored Blood
4. Blood Stores
5. Cleaning of Apparatus

the need for which was mentioned in my report to Sir Wilson Jameson, circulated to you earlier this year.

The medico-legal experts have advised (1) parental consent for donors under 21 years of age, and (2) a signed enrolment form initially.

Will you please send me any comments and suggestions you wish to make, so that the final texts can be agreed?

Yours sincerely,

pp. W. d'A. Maycock.

GB.

Circulated to Regional Blood Transfusion Officers
and London Depot Directors.

(73)

# MEDICAL EXAMINATION AND CARE OF DONORS

With the establishment of a National Blood Transfusion Service it is desirable that there should be a definite policy on the medical examination and care of voluntary blood donors, which should be punctiliously followed in all Regional Transfusion Centres.

## Medical Examination of Donors.

1. Donors should be healthy persons of either sex between 18-65 years of age. Parental consent should be obtained before donors under 21 years of age are bled. The removal of 440c.cm. of blood from such healthy persons has in general no deleterious effect on health or resistance to disease, and only a temporary effect, rapidly recovered from, on the circulation. A proportion of donors, variously estimated at 2-5%, faint. This is usually only a temporary matter, quickly recovered from but in a few instances prolonged and troublesome. The "delayed faint" is the potentially dangerous type since the donor may be in the street or at work. Fainting is probably psychological in origin, and cannot be forecast by the most elaborate medical examination.

2. The medical examination to which the donor is subjected must therefore determine whether the donor is in normal health. Of this the donor is the best judge, and, if he will truthfully answer simple questions concerning his medical history and general health, the main part of the medical examination has been done. The donor should thus be subjected to a short series of questions about his present health and medical history, designed to satisfy the medical officer that he is in normal health and has not recently suffered from any serious or debilitating illness (e.g. jaundice within the previous six months). These questions should be asked by the medical officer each time the donor presents himself. The effectiveness of this medical questionnary can be increased by instructing the receptionist and donor attendants to ask all donors tactfully and unobtrusively if they have been quite well, or if they have been receiving medical attention recently.

The donor presenting himself for the first time should also be asked the following specific questions which may with advantage be in printed form:

"As far as I know, I am in good health and have not suffered, and am not suffering, from

| | | |
|---|---|---|
| x Consumption | x Diabetes | Anaemia |
| x Epilepsy | x Goitre | Jaundice (within the last 6 months). |
| x Cancer | Kidney disease | |
| x Malaria | Heart disease | |

Signed ....."

Persons with a history or evidence of those conditions marked x should be rejected. Persons with a history or evidence of the others should be accepted deferred or rejected after consideration. In general it is the policy of the transfusion service to accept as donors only persons in normal health with a good medical history.

The hypertensive should be treated on his merits. In general the practice of bleeding hyperpietic donors is not recommended, because of the possible complications which may follow a sudden lowering of arterial tension. They should not be bled without their own doctor's recommendation in writing, and then only if the medical officer concerned is himself satisfied that they are fit to be bled.

3. The medical history should be coupled with a careful assessment of the donor's appearance. The experienced medical officer can detect at a glance the potentially unsuitable donor-the suspiciously anaemic, the poor physique, the debilitated, the undernourished and underweighted, the mentally unstable and those bearing the obvious stigmata of disease. Such should not be bled.

4. In addition the haemoglobin should be determined each time the donor presents himself. Those with less than 80% haemoglobin (Haldane Scale) should not be bled. The type of test is left to the descretion of the Regional Transfusion Officers, but the Phillips-Van Slyke Copper Sulphate Method (1945) is recommended for use as a screen test. Those donors whose haemoglobin is below 80% (Haldane Scale) should be informed that they are anaemic, and, if a screen test has been used, a sample of blood should be taken for a more exact determination of the haemoglobin level and, if possible, red blood cell count, the result of which should be sent to the donor together with advice that he should see his own doctor or attend at outpatients.

5. The superficial physical examination (auscultation and percussion of the chest, pulse and blood pressure readings) is so incomplete and unrevealing as to be hardly worth doing. It is better to rely on a normal medical history, general appearance and haemoglobin level, Such an examination, however, may satisfy the donor, if not the doctor, and as such is sometimes useful for psychological reasons in order to provide an obviously unfit but persistent donor with a concrete reason for rejection.

6. The com;lete medical examination, to include X-ray examination, electrocardiogram, haematological examination etc., is obviously impracticable.

Summary.

1. All donors should be healthy persons of either sex between 18 and 65 years of age. Parental consent should be obtained before donors under 21 years of age are bled.

2. The medical examination should consist of:-

(a) A short series of questions designed to reveal the donor's present state of health and his medical history. The new donor should be asked specific questions regarding certain diseases, mentioned above.

(b) An assessment of his general appearance.

(c) A haemoglobin determination. Donors whose haemoglobin is below 80% (Haldane Scale) should not be bled: they should be informed that they are anaemic and advised to visit their own doctor.

3. The above-procedure should be carried out meticulously. It is one of the most wearying parts of the bleeding routine, but if skilfully used will lead to the rejection or deferment of donors unfit to be bled. When in doubt it is better to reject or defer. The medical officer should see that an appropriate entry is made upon the donor's record card.

Document 2

## MEDICAL CARE OF THE DONOR

Apart from his courteous and considerate treatment by all members of the blood collecting team, the donor's medical well being should be assiduously watched by the medical officer and the members of the team, while he is in the transfusion centre.

The donor's medical well-being depends upon:-

(a) The use of carefully prepared sterile apparatus.

(b) An immaculate technique of venepuncture. Sterilisation of the skin should be carried out by a well-tried method, such as that described in M.R.C. War Memorandum No4. 2nd Edition.

(c) Skilfully performed venepuncture. Not more than 440c.cm of blood should be withdrawn. Persons weighing less than 7 stones should not be bled. No matter how skilled the medical officer, he will occasionally "miss" a vein. Further attempts should not be made without the donor's permission. It is usually not advisable to use the other arm, unless the donor is particularly anxious that this should be done. In factories it is good policy never uo use the other arm.

(d) The enforcement of a definite routine upon the donor during the resting period after withdrawal of blood.

1. A donor attendant should assist the donor to the rest room where he should lie recumbent for at least 15 minutes by the clock, after which he should sit up for at least 5 minutes.

2. During the resting period of 20 minutes the donor should consume at least one cup of fluid and a few biscuits.

3. Before the donor leaves, the site of venepuncture should be inspected by the medical officer, who will on occasion be able to forestall complaints from a donor by warning him that his arm will become bruised from a haematoma etc. The donor should be given tabs, ferrous sulphate gr. iii. sufficient for 7 days.

4. Small cards (specimen attached), giving advice to donors, should be displayed in the rest room.

(e) Donors who faint should receive immediate and considerate attention and be screened from the others.

The importance of these measures and the reasons for them must be carefully impressed upon the lay-members of the bleeding team. The reputation of the N.B.T.S. and the readiness with which donors will volunteer in the future will depend largely upon the standard of medical care given to the donor.

Donors: Complaints and accidents.

The need for sympathetic, prompt and thorough investigation of all complaints made by the donors, no matter how trivial, is obvious. The following routine, which has proved of value in practice, is recommended:-

1. Minor accidents and any untoward accidents occurring during a blood collecting session - e.g. haematoma, fainting, damage to, or loss of a donor's property, should be noted at the time upon the donor's record card. The recording of such apparently trivial incidents has in practice proved of value as long as two years later.

2. Serious incidents or accidents occurring during bleeding sessions, or complaints made direct to the R.T.C. should be recorded in a book kept for the purpose, together with full notes of any investigations made.

An analysis of complaints and accidents thus recorded should be made using the following headings, and attached to the annual progress report:-

Haematoma, Cellulitis, Thrombosis, Accidents due to fainting. Dermatitis, Unclassified, Total. Ratio to total number of donors bled. The number of accidents serious enough to merit financial compensation should be shown together with, if available, the amount of compensation paid.

Document 2A

## ADVICE TO DONORS.

1. Keep the dressing on your arm for two days.

2. Do not lean on your arm and do not use it more than is necessary today. Let nurse help you on with your coat. If you follow this advice, the puncture in your arm will quickly heal.

3. If your arm should start bleeding after you have left, press firmly on the dressing with your other hand. This will stop the bleeding at once. You should then have a clean dressing put on.

4. Sometimes when blood is drawn, a little stays under the skin and produces the appearance of a bruise. This is in no way dangerous and will disappear in a few days.

5. If you should feel unwell after you have left, lie down for a few minutes. If you cannot lie down sit with your head between your knees.

6. Drink plenty of fluid today, especially if the weather is warm.

7. The Blood Transfusion Service greatly appreciates your support. It wants you to have the least possible worry or inconvenience from your donation. If you have any problems connected with it, or suggestions to make, do not hesitate to communicate with us.

Document 3

## STORED BLOOD.

Stored blood is a potentially dangerous fluid. Even under ideal conditions about 1-2% of bottles of stored blood contain contaminants derived from the skin and the air, which do not always reveal themselves by causing haemolysis. Such contaminants, if prevented from multiplying, are usually harmless but certain coliform organisms will grow prolifically even at 2-4° centigrade, and may not cause any obvious change in the appearance of the blood.

The safeguards which can be used at the present time to maintain sterility are:-

1. The use of scrupulously clean sterile apparatus for blood collection.

2. Adequate and controlled sterilisation of all apparatus and equipment.

3. Immaculate technique of blood collection.

4. Immediate and continuous refrigeration of blood from the time of collection until the blood is used. To achieve this-

   (a) Mobile team lorries will be equipped with refrigerators into which the blood will be put immediately after collection.

   (b) Blood should be delivered from R.T.C's to hospitals etc. in insulated boxes or refrigerators.
   The time during which blood is removed from the refrigerator for, e.g. compatibility tests, should in no circumstances exceed 30 minutes.

The blood group should be determined each time a donor is bled for stored blood: the agglutinogen content of the cells and the agglutinin content of the serum should always be tested.

The effectiveness of these measures should be controlled by:-

1. The culture of one in every five bottles of time-expired blood in those depots not providing plasma which is cultured at the Lister Institute.

2. A monthly analysis of reported transfusion reactions, using the standard franked report cards. It is realised that this gives only a rough indication, but a sudden increase in the reaction rate may be a warning sign of the failure of some stage of technique.

Regional Blood Transfusion Officers should keep vigilant watch over all processes concerning stored blood, and ensure that their staffs fully appreciate the need for conscientious, accurate, and clean work, and that the above principles are enforced.

Document 4

## BLOOD STORES.

The Regional Transfusion Centres obviously cannot assume responsibility for the condition of blood after it has been delivered to hospital "blood stores": they must ensure however that such blood is in fact fit for use when delivered by exercising every reasonable care and precaution during its collection, manipulation in the Regional Transfusion Centre and transport to the blood stores. Regional Blood Transfusion Officers should ensure that this division of responsibility is known to hospitals with blood stores.

Regional Blood Transfusion Officers should satisfy themselves that hospitals etc, holding blood stores are fully informed of the conditions under which blood should be stored and the precautions which should be observed. These are outlined on NBTS/17, which should be issued by R.T.C's to all such hospitals. Blood stores should be inspected by a medical officer of the R.T.C. at regular intervals (not less than every three months) to see that these conditions are fulfilled and that all necessary precautions are being taken.

The importance of appointing a medical officer, preferably the pathologist, in each hospital to assume the care of the blood store cannot be over emphasized, and should be made clear to hospital authorities. In particular the dangers inherent in the practice of allowing persons unskilled in bacteriological technique to open bottles of blood to obtain samples for compatibility tests, must be impressed upon all concerned. Unless hospital staffs thoroughly appreciate the potential dangers of stored blood, the necessity for the rigid control of blood stores, and the need for meticulous sterility in all manoeuvres involving the opening of bottles of blood, the use of stored blood will eventually be brought into disrepute. To avoid this, constant "education" of the medical profession must always be one of the more important duties of the R.T.C. staff.

N.B.T.S./17

# NATIONAL BLOOD TRANSFUSION SERVICE

## CARE OF THE BLOOD BANK

1. The care of the blood bank should be the duty of an appointed medical officer. He should supervise all issues of blood and make regular inspections, preferably daily. Issues should not be delegated to porters, orderlies, or nurses.

2. Conditions of Storage: Blood must be stored at 4-6° Centigrade (38-42° Fahrenheit). A maximum and minimum or recording thermometer must be used. The refrigerator must be serviced regularly.

3. Fitness for Use: There should be a clear line of demarcation between cells and plasma. The plasma should show no haemolysis. Reliance should be placed on appearance of the blood rather than its age, although outdated blood should not be used. The appearance of the bottle must be assessed before it is shaken.

4. Outdated Blood: Should be set aside in the refrigerator for return to the Regional Transfusion Centre. It must not be allowed to accumulate.

5. Blood removed from the refrigerator for more than 30 minutes and NOT used: The "Dangerous for Patients" label should be stuck over the group label, before the bottle is replaced in the refrigerator. Blood should never be removed from the refrigerator until just before use.

6. Bottles opened once (except for the purpose of taking compatibility tests, with due aseptic precautions) and not used should be labelled "Dangerous for Patients" as under para. 5.

7. Compatible blood of homologous group should be given. In the event of a reaction, the bottle must be replaced in the refrigerator and a 5 c.cm. sample of blood taken from the patient one hour after the end of the transfusion.

8. Records: A record of the use of the blood must be kept showing the reference number of the bottle, date and time removed from the refrigerator, and patient for whom used.

The refrigerator temperature should be recorded daily, morning and evening, in a special book.

9. Used Equipment: All used equipment should be rinsed with cold water after use, except when there is a reaction.

This will be printed on a fairly stiff card - quarto size - in red type.

# CLEANING OF BLOOD TRANSFUSION EQUIPMENT.

The following minimum standards of cleaning transfusion equipment should be observed in Regional Transfusion Centres.

## NEW EQUIPMENT

1. Glassware. (Bottles, drip counters, glass-tubing, etc.) should be thoroughly washed in hot soapy water or water containing a detergent. It should then be rinsed in tap water, freshly distilled water, and drained, or preferably, dried in an oven.

Cleaned glass-ware should be stored in clean dust proof containers. Bottles should be capped. Before use, bottles should be rinsed out with distilled water.

2. Bottle Caps and Rubber Wads.

Rubber wads should be removed from the aluminium caps, and washed in way described under "Rubber Tubing". It may be found necessary to scrub some batches of wads in hot soapy water after boiling in alkali.

Aluminium caps should be boiled in hot soapy water for 20 minutes, rinsed, and boiled in tap water for 20 minutes. They should then be rinsed in distilled water, drained and dried. Scrubbing may be necessary after the initial boiling in some instances.

Refit rubber wads into caps, and store in a clean dust-proof container. Caps and wads should be rinsed in distilled water immediately before use.

3. Rubber Tubing etc.

(a) New rubber tubing should be boiled for one hour in 5% sodium carbonate solution (2oz. washing soda per qt.) or 1% sodium hydroxide. Care must be taken that the solution fills the lumen of the tubing.

It should then be rinsed with hot tap water under pressure, pulled through with a piece of cloth or gauze mounted on a stiff wire, the cloth or gauze being frequently renewed, or with a small brush, after which it should be boiled for 15 minutes in tap water, rinsed with hot tap water under pressure, and then with distilled water, drained and dried. If the tubing is not to be used for the assembly of sets which will be autoclaved within 4 hours, it must be thoroughly dried.

(b) New rubber bungs should be treated in the same way.

4. Wire gauze-filters should be soaked in water, brushed with a stiff brush, boiled for 30 minutes in tap water, rinsed in distilled water, and dried.

5. New Needles. After sharpening, the interior of the barrel should be inspected, and cleaned with a stilette if necessary: it should be smooth and shining. All needles after sharpening should be washed through with hot water under pressure, and dried in an oven, or by successive immersions in alcohol and ether.

## USED EQUIPMENT.

All used giving and taking sets, after soaking overnight in cold water (if this has not already been done by the hospital etc. by which they have been returned), should be dismantled into their component parts, which should be washed separately.

1. Glassware

Bottles: should be washed as above.

Drip-counters and glass tubing: should be immersed in chromic acid cleaning solution for 4-7 days, washed repeatedly in running tap water thoroughly rinsed in distilled water, drained and dried in an oven.

2. Bottles caps and rubber wads, should be washed separately in hot soapy water, rinsed in tap water, distilled water, and dried, preferably in an oven. Refit rubber wads into caps and store in a clean container. Caps and wads should be rinsed in distilled water before use.

3. Rubber tubing etc.,

(a) Used rubber tubing should be washed thoroughly with hot water under pressure and pulled through until the cloth or gauze is unsoiled: it should then be washed again with hot water under pressure, rinsed with distilled water and dried.

(b) To control the standard of cleaning, pieces of used rubber tubing after being cleaned should be slit open from time to time and inspected.

(c) Rubber bungs should be scrubbed in hot soapy water, rinsed in distilled water and dried.

4. Wire gauze filters, should be well-soaked in cold water, brushed free of adherent blood clot under hot pressure water, and rinsed well in tap water. After rinsing in distilled water, they should be dried in an oven.

Mantle Filters: should not be used a second time except in emergency. Used filters may be cleaned by rinsing thoroughly under pressure water after which they should be boiled for 30 minutes, or placed in hydrogen peroxide. They should then be well rinsed in distilled water, and dried in an oven.

5. Used Needles must be carefully freed of all adherent blood or plasma by washing under pressure, after which the bore should be carefully cleaned with a stilette, and the butt with a pipe cleaner or cotton wool mounted on a swab stick. After sharpening the needles must again be washed through under pressure, and bore inspected to see that it is smooth, shining, and free from adherent "burr". The needles may be dried in an oven or by successive immersions in alcohol and ether.

Notes

1. Freshly distilled water, collected from a baffled still run at less than full capacity into clean (preferably sterile) containers should be used for the find rinsing of all equipment.

2. Cleaned equipment should preferably be used at once, the transfusion sets assembled from it being autoclaved within 4 hours. Should cleaned components etc. be stored they must be thoroughly dried with the least delay in order to prevent the development of pyrogens. They should be rinsed in distilled water before used for the assembly of transfusion sets.