These Guidelines, based on Guidelines from a Working Party of the Regional Transfusion Directors Committee of the N.B.T.S., have been prepared by the Transfusion Task Force of the B.C.S.H. for joint publication by the British Society for Haematology and the British Blood Transfusion Society.

Membership of the Working Party of the Regional Transfusion Directors Committee of the N.B.T.S.

Dr. D. Lee (Chairman)
Consultant in Charge, Lancaster Transfusion Centre.

Professor H. A. Brant
Obstetrician, University College and Middlesex School of Medicine.

Dr. M. Contreras
Director, North West Thames Regional Transfusion Centre.

Dr. I. W. Delamore
Haematologist, Manchester Royal Infirmary.
(Chairman, Clinical Task Force, B.S.H.)

Dr. L. A. Kay
Haematologist, Sunderland Royal Infirmary.

Dr. P. Kingston
Haematologist, Gloucester Royal Infirmary.

Dr. J.A.F. Napier
Director, Cardiff Regional Transfusion Centre.

Dr. W. Park
Anaesthetist, Royal Lancaster Infirmary.

Dr. M. Pippard
Haematologist, Northwick Park Hospital.

Membership of the Transfusion Task Force of the B.C.S.H.

Prof. A. Waters (Chairman)
Dr. F. E. Boulton
Dr. D. Dawson
Dr. I. D. Fraser
Mr. A. N. Horn (DHSS)
Dr. R. Jennings (DHSS)
Miss E. Lloyd
Dr. J.A.F. Napier
Dr. B.E. Roberts
Dr. A. Smithies (DHSS)
Dr. D. Voak
Dr. W. Wagstaff
Dr. J. K. Wood

GUIDELINES FOR AUTOLOGOUS TRANSFUSION

General Considerations

1.1. Autologous Transfusion can provide an alternative to using blood from volunteer donors for some patients for elective surgical procedures, avoiding the possibilities of isoimmunisation and of acquiring those infections which may be transmitted by a blood transfusion. The guidelines in this document relate to blood collected up to 35 days before an elective procedure and stored at 4°C.

1.2. Pre-deposit of blood to be stored frozen for longer periods is not considered.

1.3. Directed blood donation, that is donation from relatives or motivated friends of the patient, is not considered either and should be actively discouraged since there is no evidence that directed donations are safer than blood provided by the Transfusion Services. Indeed one has to consider that a relative who is in a risk group and under pressure to donate may find it difficult or impossible to avoid doing so.

2. Autologous Transfusion will only be appropriate for a minority of patients; estimates vary depending on several factors of which the more important are the type of patient and surgical procedure studied and the enthusiasm for autologous transfusion of the author of the particular publication. Clearly, the general fitness of the patient to allow several donations to be taken over a short period is of primary importance but other factors such as age, venous access, reliable dates for elective surgery will also be important. Another significant consideration will be the distance from the patient's home to the hospital.

3.1. The cost of autologous transfusion in the U.K. can only be estimated at the present time and it is uncertain.

3.2. It has been stated by some advocates of autologous transfusion that it is cheaper than using homologous blood from the Transfusion Services, but this is not immediately obvious since costings need to take account of blood which is collected and not transfused as well as of blood which is used. Costings will also depend on the number and nature of tests performed.

3.3. It is recommended that those considering plans to offer autologous transfusion to patients should only do so when appropriate funding has been earmarked and given a priority in their local revenue development programme. Apart from rare medical indications for autologous transfusion (e.g. multiple isoantibodies making all donors incompatible) patients having autologous transfusion will do so from preference. In the light of present financial restrictions in the N.H.S., development of autologous transfusion programmes for these patients will almost inevitably be at the expense of some other part of the service.

4. The advocates of autologous transfusion are concerned with avoiding transfusion of homologous blood and it is appropriate to draw attention to other factors which assist with achieving this aim, particularly to the use of haematinics rather than transfusion to raise the haemoglobin where

appropriate and to avoiding "one unit" transfusions other than in exceptional circumstances. Equipment designed to salvage shed blood for retransfusion ("cell savers") can also contribute to reducing transfusion requirements. Intraoperative haemodilution may also have a role.

5. Because autologous transfusion avoids the possibility of isoimmunisation or acquisition of diseases transmissible by blood transfusion and is therefore regarded as safer in these respects than homologous transfusion, patients being considered for autologous transfusion need to be aware that the procedure has its own inherent risks, particularly those associated with labelling and documentation, and that transposition and transfusion of the wrong blood is a remote but real possibility. A decision to opt for autologous transfusion rather than homologous transfusion is a matter of assessing and balancing the relative risks of the procedures. Patients should have a realistic picture of the risks which they are seeking to avoid by having autologous transfusion and of the record of very safe transfusion practice based on voluntary donations in this country.

Selection of Patients

6.1. Autologous transfusion should only be offered to those patients who would normally be crossmatched for the procedure to be undertaken. Patients who would usually have a "group and save" should not be considered.

6.2. An active bacterial infection is a contraindication to collecting blood for autologous transfusion because of the possibility of bacteraemia which might lead to proliferation of bacteria in stored blood.

6.3. Patients suitable for elective surgical procedures who are between the ages of 16 and 65 can be considered, provided that they are free from cardiovascular, cerebrovascular and respiratory disease. Patients over the age of 65 should be considered in the context of their general health since cardiovascular problems increase with age. In young patients, the undesirable effects of several venepunctures on some children need to be considered as the anxiety generated may complicate the induction of anaesthesia for the surgical procedure.

6.4. Patients under 7.5 stone (45 Kg) need special consideration and it may be appropriate to withdraw smaller volumes than those quoted in Appendix D.

6.5. Patients with a history of fits should not be considered as withdrawal of blood may precipitate an attack.

6.6. Patients who have been blood donors and have sustained a delayed faint, i.e. weakness or loss of consciousness several hours after donation, should not be considered.

6.7. The patient's haemoglobin should be greater than 12g/dl in men and 11g/dl in women. In pregnancy, the haemoglobin should exceed 10g/dl.

6.8. Autologous transfusion can be considered in pregnancy if the patient is fit on other grounds and is not suffering from a complication, e.g. intrauterine growth retardation or pre-eclampsia, which may already have reduced the patient's blood volume. (See also Appendix D).

6.9. Selection of patients and consideration of their fitness for the

procedure and of the other criteria in this section should be undertaken by the clinician with clinical responsibility for the patient and he/she should also discuss with the patient the relative merits of autologous and homologous transfusion and the possibility that even if autologous transfusion is prepared, it may be necessary to transfuse homologous blood. Referral of suitable patients who wish to have autologous transfusion to the Haematologist should be in a standard format signed by the Consultant who has discussed autologous transfusion with the patient. (Appendix A).

Practical Aspects of Collection, Storage and Transfusion

Collection

7.1. Collection and storage of blood for autologous transfusion should be directly supervised by a Consultant Haematologist. Assuming that the patient has suitable veins and is willing to attend on several occasions, the Haematologist should seek the patient's written informed consent to the procedure (Appendix B) advising the patient about possible complications, particularly the possibility of needing homologous transfusion in addition to any blood prepared for autologous transfusion. The Haematologist or a deputed Medical Officer should be immediately available during blood donation.

7.2. Blood collection procedures differ in detail between Regions and between Regional Transfusion Centres and Hospitals. Important points of procedure can be found in Appendix D. Consultation with the Regional Transfusion Centre may also be appropriate.

7.3. Blood should not be drawn more often than once a week the last preferably a week, but a minimum of four days, before surgery; this will normally allow up to four or five units to be collected. Exceptionally, e.g. where surgery is postponed, it may be possible to use a 'leap-frog' technique, returning the oldest unit(s) to the patient to allow another (others) to be withdrawn.

7.4. Estimation of the haemoglobin should be carried out before each donation. The haemoglobin should be greater than 12g/dl in men and 11g/dl in women before the first procedure and preferably before subsequent donations. Where the haemoglobin is less than 10g/dl, blood should not be collected.

7.5. All patients for autologous transfusion should have a prescription for oral iron.

7.6. The label for the blood pack should include the information listed in Appendix C. The patient should sign the label and should do so immediately before donation, i.e. when the patient is on the couch and after the label has been completed and stuck on the pack. The label should have a suitable adhesive for refrigerated storage.

7.7. The following tests should be carried out on the patient
- (a) ABO and Rh (D) - results to be entered on the pack label
- (b) Serological screening for atypical antibodies - in case additional homologous blood is required.

(c) Tests for HBsAg, Anti-HIV and Syphilis. These are essential both to establish the patients status for these markers and because current practises are such that donations which are positive for any of these tests would not be issued for use and the same criteria should apply for autologous transfusion.

Storage

8.1. Blood for autologous transfusion should be stored in a refrigerator at a controlled temperature between 4°C and 6°C separate from normal blood stocks and crossmatched blood.

8.2. This refrigerator should be equipped with a recorder and with an alarm similar to those on other fridges used for blood storage.

Tests pre-transfusion

9.1. A fresh sample should be obtained from the patient for matching purposes when he/she is admitted for surgery.

9.2. The minimum compatibility testing procedure should include ABO and Rh (D) checks on the patient and on the donations as well as a room temperature 2 to 5 minute spin tube test ('donor' cells x 'patients' serum), read microscopically.

9.3. The standard compatibility testing procedure may integrate better into the routine of most laboratories.

9.4. Each donation should carry a compatibility label which is used routinely in the hospital to facilitate checking in theatre and at the bedside. Design of the autologous transfusion label should allow the compatibility label to be overstuck leaving the information about the blood group and expiry date readily visible.

10. Disposal of Unused Blood

Blood collected for autologous transfusion which is not required for the donating patient must not be transfused to another patient. Blood for autologous transfusion which is not transfused may be used, provided that HBsAg and anti-HIV tests have been carried out, for laboratory purposes. Otherwise unused blood must be discarded. Plasma from unused blood should not be included in pools for fractionation. The fate of autologous blood should be fully documented to ensure that each unit can be accounted for (circular 8C/84(7)).

11. Quality Control

A proportion of donations collected for autologous transfusion should be cultured for possible contaminating microorganisms. This can most easily be achieved by culturing some or all, depending on numbers, unused donations. At least one per cent of blood collected should be cultured by both aerobic and anaerobic techniques.

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APPENDIX A

REFERRAL LETTER TO CONSULTANT HAEMATOLOGIST

Dear

This patient has requested Autologous Transfusion for his/her operation. I have discussed this with the patient, with appropriate reference to "Guidelines for Autologous Transfusion" and am of the opinion that he/she is medically suitable for the procedure.

I would be grateful if you would see him/her with a view to making the necessary arrangements.

Patient's Name (Mr/Mrs/Ms): .....

Patient's Address: .....

.....

Patient's Date of Birth .....

Ward: .....

Hospital: .....

Hospital Number: .....

Date of Admission: .....

Date of Operation: .....

Planned Procedure: .....

Underlying Pathology: .....

Requested Number of Donations ☐ (maximum is 5)

Haemoglobin (g/dl) ☐

Signature of Referring Consultant Clinician: .....

Name of Referring Consultant Clinician: .....
(BLOCK LETTERS)

Date: .....

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APPENDIX B

Consent to Autologous Transfusion

The purpose of autolgous transfusion has been explained to me by Dr..... who has also explained its possible complications and hazards.

I agree to my blood being withdrawn and stored for autologous transfusion.

I understand that it may not be possible for technical reasons to return to me all or any of the units which I donate.

I understand that it may be necessary to supplement my autologous transfusion with blood from volunteer donors from the Transfusion Services.

I agree to my blood being tested for HBsAg (one of the viruses causing Hepatitis) and for Anti-HIV (the virus associated with AIDS), and syphilis.

SIGNED

DATED

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APPENDIX C

BLOOD PACK LABEL

Blood for autologous transfusion should be identified with an overstick label* which includes the following information:

BLOOD FOR AUTOLOGOUS TRANSFUSION ONLY

SURNAME

FIRST NAMES

DATE OF BIRTH

HOSPITAL NUMBER

DATE OF COLLECTION

DATE OF EXPIRY

ABO and Rh (D) TYPES

LAB. REF. NUMBER

PATIENT'S SIGNATURE

The patient signs the pack to confirm that the details on the label (apart from the ABO and (D) type which may not be entered when the first unit is drawn) are correct. The signature can also be compared as part of a pre-transfusion checking procedure with the signature on the consent form which by then will be in the patient's notes.

*This label should not occlude the information given on the manufacturer's standard pack label.

APPENDIX D

BLOOD COLLECTION

The following points are of importance in collecting a blood donation.

1) Check the patient's blood pressure.

2) Collect blood into a single pack with CPD-A1 anticoagulant to give a shelf life of 35 days.

3) Use a balance to measure the volume of blood drawn.

4) The skin should be cleaned thoroughly using Chlorhexidine (in alcohol) or equivalent.

5) The use of local anaesthetic is recommended.

6) The donor tubing should be clamped, e.g. with 'non-toothed' Spencer Wells forceps, before the guard is removed from the needle. This will prevent air entering the bag and possibly contaminating the donation. The clamp should remain in place until after the venepuncture.

7) A normal donation should be approximately 450ml, but a smaller volume may be appropriate. Packs for the collection of 250ml are available.

8) The pack should be agitated gently throughout collection to mix the blood with the anticoagulant.

9) Samples for laboratory tests can be taken at the end of the donation before the needle is withdrawn by clamping the donor tube in two places and cutting the tube between the clamps.

10) Attention to haemostasis after withdrawal of the needle will be particularly important if several donations need to be collected from the vein.

11) It is important to use a roller stripper to evacuate the blood from the donor tube into the pack and allow it to be replaced with anticoagulated blood.

12) The donor tube should be sealed, both at its cut end and close to the pack.

NOTE: PREGNANT PATIENTS

In the latter part of pregnancy, the weight of the uterus in the dorsal position impedes venous return. Because of this, these patients are more likely to react adversely to venesection and donations should therefore be collected with the patient lying in the lateral position.

APPENDIX E

This Fact Sheet provides information for patients. Additions or amendments, taking account of local practices, may be needed.

FACTS ABOUT AUTOLOGOUS BLOOD TRANSFUSION

What is Autologous Blood?

Autologous Blood is blood from an individual to be given back to that individual should the need for transfusion arise. Blood can be stored for up to 35 days between collection and use.

What are the advantages of Autologous Blood

Autologous blood has the advantage over blood from other individuals in that it is incapable of stimulating antibodies to red cells, white cells, platelets and plasma proteins. It also carries no risk of transmitting infections such as hepatitis or AIDS. However, the very small risk of bacterial contamination at the time of collection is the same as for any blood donation.

What are the disadvantages of Autologous Blood?

In general, donation for autologous transfusion has the same minimal risk as any blood donation. Because of the need to collect several units of blood within a period of a few weeks, it will be necessary for the patient to take an iron supplement. There is also a minimal risk that blood other than one's own may be transfused accidentally.

Who may donate for Autologous Transfusion?

Patients between the ages of 16 and 65, and some older patients whose general health is good, can be considered for autologous transfusion for

some planned surgical and obstetric procedures. The Consultant in charge of your case will decide if you are suitable for autologous transfusion.

How many units of Autologous Blood may be donated?

The exact number would be determined by your Consultant. As many as four or five units may be taken at approximately weekly intervals prior to the planned date for surgery.

Where is blood donated?

The donations will be taken at your local hospital or Regional Transfusion Centre. The request is made by your Consultant to the Haematologist who will arrange to collect and store your donations.

How long does the procedure take?

Collecting a donation takes about 30 minutes each time, after which you will be asked to rest for 15 minutes before leaving. You can drive a car afterwards if you feel perfectly well, but it may be advisable to have a friend who is willing to drive on the first visit. If you feel unwell or if you are in any doubt, you should inform the Haematologist. Some occupations involve some personal risks or include responsibility for the safety of others. If such hazards are a normal part of your work, ask the Haematologist how long you should wait before resuming your activities.

Points to note after the donation

1. **Most people feel fine after donating**

   However, if you should feel light headed it may mean that your system has not had enough time to adjust. You should restrict your activities, and if necessary, lie down and rest until you feel better.

2. **Drinking extra fluid helps to replace some of the liquid portion of the blood you have donated.**

You will normally be offered a drink following donation.

3. **If your arm starts to bleed, do not be alarmed**

Simply raise the arm above your head and apply gentle continuous pressure immediately to the venepuncture for 10 or 15 minutes until bleeding stops.

4. **Occasionally the area may appear bruised**

This discolouration will disappear within a few days and should cause you no concern.

5. **Usually the venepuncture heals without difficulty**

However, if the site should become reddened and painful, you should contact the Haematologist or your General Practitioner.