8 3

14 APR 1986

~~For consideration by the~~ Area Executive ~~Team~~ ~~Committee~~

on 18th April, 1986

To: Dr. McKenna
Miss Haynes.

E.H. & S.S.B. RECEIVED [illegible] PLANNING DEPT.

SUBJECT:

PLASMA SUPPLIES - BLOOD TRANSFUSION SERVICE

File No. EB 8040/PP
EB 7009/PP

file to P&P Ctee
agn on 24/4/86
(Miss Johnston)

DETAILS:

The attached paper (Paper AET No. 24/86) from Dr. McClelland highlights the service need and financial benefit ~~of~~ from investing in the development of a plasmapheresis unit and a blood pack system in the Blood Transfusion Service.

In summary, by 1987 it is estimated that at current rates of supply there is likely to be a substantial shortfall in the plasma required. Of the options examined the most clinically acceptable and cost-efficient way to allow the BTS to become self-sufficient in the supply of plasma is to develop the plasmapheresis unit and a blood pack system. These should be phased in during 1986/87 and 1987/88.

The development will require the following investment:-

	1986/87	Capital	£32,000	Revenue	£175,000 (approx. half the revenue costs)
(Estimate)	1987/88	Capital	£43,000	Revenue	£175,000

The £100,000 allocated by DHSS for Factor VIII and Blood Products will not be sufficient to cover the costs of this proposal in 1986/87, given expected expenses in relation to Factor VIII and other products.

AET agreement is sought to the proposed development on the basis that the necessary capital and revenue funds are made available by the Department..

P.T.O.

SUBMITTED: P. Haynes	DATE: 10.4.86.	APPROVED:	DATE:

10/86 PLASMA SUPPLIES - BLOOD TRANSFUSION SERVICE

The Team received paper AET 24/86 in respect of a proposal for the development of plasmapheresis unit and blood pack system in the NI Blood Transfusion Service.

It was considered that a move towards self sufficiency in blood products makes sound economic sense, and it was AGREED that a submission should be made to the DHSS for the capital and revenue funding to enable a collection service to be established. It was also AGREED that this matter be referred to the Policy and Planning Committee at its meeting on 24 April 1986. AO/Planning AO/A

To: Miss Haynes AO/A.

For appropriate action please, in accordance with Committee's decision.

Separate A/S to AO/A.

DATE: 14/4/86 GRO-C 25-4

U/M50/50

PLANS FOR FUTURE BLOOD PRODUCT REQUIREMENTS.

INTRODUCTION

The demands for conventional blood transfusion (whole blood and red cell concentrates) has shown only a modest increase in recent years. In contrast the demands for a number of blood products (prepared as by-products of normal donations) has shown a dramatic increase over the past 5-10 years and furthermore, this upsurge shows no sign of slackening. In this regard, the two products which are by far the most important from the point of view of supply and cost are Factor VIII and Albumen.

Albumen (SPPS and 20% Albumen)

The production of albumen within the Transfusion Service (NHS material) has been rising rapidly but this has still been insufficient to meet demand which has grown just as steeply and continues to do so. The short-fall (currently 25% of total) is achieved by purchase of commercial material. The cost of the latter has almost doubled during the past 12 months as a result of a world shortage in albumen. This fact has made commercial albumen very unattractive financially.

Factor VIII

Since Factor VIII concentrate became available, the demand for this product in the management of haemaphilia A has been rising rapidly. This increase has been less apparent in the past 1-2 years because the risk of AIDS has had to be balanced against the benefits of treatment. Now that heat-treated Factor VIII (assumed to be free of the AIDS risk and possibly hepatitis) is available, the demand has taken off again and is likely to continue increasing steadily. Unfortunately, the problem of supply is compounded by the fact that heat-treatment leads to a 15-20% reduction in yields so that correspondingly more raw material (fresh frozen plasma) must be procured.

Apart from patient safety and other reasons (see below) it is important from a financial point of view that self-sufficiency in Factor VIII is maintained as the cost of commercial Factor VIII is beginning to increase steadily and this trend is likely to continue, especially as the UK as a whole becomes fully self-sufficient in Factor VIII

(planned for by the end of 1986).

Why self-sufficiency in blood products?

a. Cost

Although comparisons are extremely complex it can be concluded that production of blood products as a by-product of donor blood collected by the BTS is more cost-effective than purchase of commercial material. The difference has become greater now that commercial products have become much more expensive in response to world shortages.

b. Patient safety

The source of commercial blood products is paid donors, largely from the USA, but also including some under-developed countries. The risk of transfusion transmitted diseases such as AIDS and hepatitis is thus greater than that from voluntary donors especially in areas at low risk of these infections (Scotland and N.Ireland).

c. Ethical reasons

There are a number of ethical objections to the international trade in blood products. These relate particularly to the intensive collection of blood plasma which is practiced by commercial companies in a way which may be deleterious to the health of donors (often the most poorly nourished in the community) and in some cases jeopardise blood collection in countries which are already in short supply.

For these reasons the WHO have strongly recommended that all countries should strive to become fully self-sufficient in blood products (using voluntary donors) and this principle has been accepted by all Western Governments.

With the commissioning of the new Blood Products Laboratory, Elstree, England and Wales should be self-sufficient in blood products by the end of 1986 (as applies already

in Scotland). It would seem highly undesirable if N. Ireland were to become the only part of the UK still importing blood products.

Requirements

Factor VIII

Current usage of human (NHS) Factor VIII is running at approximately 1.8 million units per annum and has now largely replaced commercially produced material. Predicted demand for 1986 is 2.5 million units rising to 3 million units for 1987. Current plasma input of fresh frozen plasma (9,000 litres per annum) entitles NI to no more than 1.8 million units of heat-treated factor VIII. In the short-term N.Ireland should obtain some additional Factor VIII from Scotland whose production in currently in excess of need. It is anticipated that this excess will not apply for more than another year as Scotland's demand is expected to increase substantially.

Albumen

Current total annual plasma input (10,000 litres) would entitled us next year to approx. 12,000 bottles per annum. Estimated requirements for 1986 is 15,000 bottles and for 1987, 17,000 bottles.

It should be noted that the patterns of demand for Factor VIII and albumen described above are similar to those found in the rest of the UK and other countries with well developed Health Services - indeed the figures are proportionally lower than most other countries.

Plasma input

In order to meet the above demands for Factor VIII and albumen from within the Transfusion Service, the input of source plasma would require to be increased from 10,000 litres to at least 15,000/annum by 1987.

In order to approach this target a completely new approach to plasma collection would be required. Up to the present, all source plasma has been harvested as a by-product from conventional blood donations. During the past 5 years the proportion of donated blood units processed in this way has increased from 20% to 80%. This means that 80% of donor units are now issued as concentrated red cells and only 20% as whole blood. It would be clinically unacceptable to increase the proportion of conc. red cells any further.

One possible method of meeting the requirement for the additional plasma, is simply to increase total blood collection to the required level (by some 40%). This approach which incidentially, would entail discarding the red cells from all additional units collected, is not practical and in any case would require the Service to take on at least 1 extra collection team (approx. 15 staff) at enormous expense. Indeed, this is now generally regarded as the most expensive method of collecting plasma which is in excess of needs for cellular products.

Two other approaches can be used, i.e. optimal additive solutions and plasmapheresis.

a. Otpimal additive solutions

This method would require the use of a blood pack system which allows harvesting of additional 80ml of plasma from each unit of blood while the red cells are suspended in the additive solution, e.g. SAG M. Replacement of conventional blood packs with SAG M packs cost an additional £2.00 each while the remaining processing costs are similar to those used at present (see costings). It would be clinically appropriate to collect about 50% of our blood donations into the SAG M system.

b. Plasmapheresis

This method involves separation and removal of an appropriate volume of donor plasma at the bed-side while the red cells are transfused back to the donor. The advantage is that not only can a relatively large volume of plasma be collected at each donation but also it is quite safe to donate more frequently than is the case with conventional

donations.

In response to the requirement for ever larger quantities of source plasma, several automated plasma collection machines have become available on the market which are designed specifically for this purpose. As a method of harvesting plasma it has become increasingly attractive and cost-effective, especially as the cost of disposables comes down.

While the cost of disposables for these machines would account for most of the revenue consequences of running a plasmapheresis unit, there would also be a need for some additional staffing (at least 1 medical officer and 4 donor attendants). In addition, the capital cost of purchasing 3 plasmapheresis machines would be required. The present donor suite at Durham Street would accommodate these.

I believe that the best method of meeting the predicted requirement of an additional 5,000 litres of plasma per annum, is by a combination of optimal additive solutions and plasmapheresis (see Appendix II). These two methods should be phased in over the next 2 years. The great majority of Transfusion Centres in the UK are already setting up plasmapheresis units as part of a drive towards self-sufficiency.

SUMMARY

It can be confidently stated that the demand for Factor VIII and albumen will rise substantially over the next 2-3 years. At current rates of supply, this would lead to a substantial short-fall in NHS products.

If no further action is taken to increase supplies of plasma, the cost of commercial material to make up the deficit is predicted to be around £500,000 per annum by 1987. It has been calculated that the cost of supplying this material within the

BTS (collection and fractionation) would be £350,000 per annum. Although this would represent a comparatively modest saving over commercial purchase, the gap is likely to become greater in future if as predicted, the cost of commercial products continues to rise steeply while disposables for plasmapheresis procedures become relatively cheaper. Finally, it should be noted that the aim of self-sufficiency is highly desirable both from an ethical point of view and for patient safety (as discussed above). If action is not taken now, N. Ireland would soon become the only part of the UK which is importing blood products.

APPENDIX I

CURRENT AND PREDICTED (1987) USAGE OF NHS FACTOR VIII AND ALBUMEN (SPPS/20% ALBUMEN)

Factor VIII (current usage)	1.8 million units/annum
Factor VIII (usage by 1987)	3 million units/annum
Cost of purchasing (commercial source) additional 1.2million units at 20P/unit	£240,000
Albumen usage	12,000 bottles/annum
Albumen usage (1987)	17,000 bottles/annum
Cost of purchasing additional 5,000 bottles at £50.00 per bottle	£250,000
Cost of purchasing additional 1.2 million units Factor VIII and 5,000 bottles albumen	£490,000

APPENDIX II

COST OF PROVIDING ADDITIONAL 1.2 MILLION UNITS FACTOR VIII AND 5,000 BOTTLES ALBUMEN

1. Plasma procurement (NIBTS) - additional 5,000 litres fresh frozen plasma

(a) SAG M - 2,000 litres/annum collection of 25,000 units of existing blood supply into SAG M system (80ml extra plasma collected per unit).

REVENUE	£
At extra £2.00 per pack	50,000
Cost of separation, freezing, transport at £10/litre plasma	20,000
TOTAL	£70,000/annum
Capital cost - Separating devices ✓	£10,000

(b) Plasmapheresis - 3,000 litres/annum

REVENUE	
(i) Disposables at £25 per litre	75,000
(ii) Testing, freezing, transport at £10 per litre	30,000
TOTAL	£105,000/annum
Staff - 1 medical officer	20,000
2 4 donor attendants (for 3 machines)	15,000
TOTAL	£35,000
TOTAL COST =	£130,000/annum
Capital cost - 3 plasmaphersis machines	£ 65,000

2. Fractionation costs (Scotland)

Factor VIII - 1.2 million units at 5P/unit	£ 60,000
Albumen - 5,000 bottles at £14/bottle	£ 90,000
	£150,000

3. Total cost of plasma collection (NIBTS) and Fractionation (Scotland) £350,000/annum

Capital cost - (3 plamsapheresis machines and separating devices for SAG M) £ 75,000

2 APR 1986

NORTHERN IRELAND BLOOD TRANSFUSION SERVICE

DIRECTOR
W. M. McClelland, M.B., M.R.C.Path.

DEPUTY DIRECTOR
C. Bharucha, M.B., M.R.C.Path.

ORGANISING SECRETARY
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89 DURHAM STREET
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our ref. WMMcC/jr

your ref.

2nd April 1986

E.H. & S.S.B.
RECEIVED
10 APR 1986
PLANNING DEPT.

Mr N C Compton
Direct Services
Londonderry House
Chichester Street
Belfast 1

Dear Newton

BLOOD GROUPING REAGENTS FROM BLOOD GROUP REFERENCE LABORATORY

We have in the past received regular supplies of blood group reagents from the BGRL and these have been free of charge. I have recently been informed (a copy of the letter enclosed) that from 1st April 1986, charges will be introduced for certain reagents, namely anti-A, anti-B, anti-AB and bovine serum albumin.

I have estimated that the annual cost of these reagents would be approximately £6,000/annum. Of this figure, approximately £3,500 would be required to purchase those reagents for use at NIBTS while the remaining £2,500 would be required to supply the needs of those hospitals which are currently supplied by us.

Yours sincerely

AET DECISION :-

DHSS capital + revenue O.K. report to be made to P+P on this matter – Dr McKenna under AOB. to state good idea if DHSS funds both capital + revenue.

W M McCLELLAND
DIRECTOR

GRO-C

P+P decision?

P. 2/5

Enc.

COPIES TO: Dr P Darragh, 65 University Street, Belfast 9
Mr Quinn, Supplies Department, College Street, Belfast 1

Copy to Pat Harries
[illegible]

AP2570

To: Miss Hawes
Planning Dept

EB 8040/PP

File No. EB 7009/PP

Committee: Policy and Planning Committee

Meeting held on: Thursday 24th April 1986

Subject: Plasma Supplies - Blood Transfusion Service

DECISION

30/86 Plasma Supplies - Blood Transfusion Service

The General Manager reported that the Director of the N.I. Blood Transfusion Service had put forward proposals for the development of a plasmapheresis unit and a blood pack system in the Blood Transfusion Service. It was pointed out that while demands for conventional blood had shown only a modest increase, there had been a dramatic increase in demand for blood products, particularly Albumen and Factor VIII. The proposal is to become self sufficient in the production of such by-products rather than buying them in at the market price which has been increasing steadily. It was noted that there would require to be an investment of capital and revenue resources to become self sufficient in these products.

The Committee AGREED that the Department of Health and Social Services be asked to provide the necessary capital and revenue resources to enable the Northern Ireland Blood Transfusion Service to become self sufficient in the production of blood products such as Albumen and Factor VIII.

GRO-C

To: Miss P. Hawes
Planning Department
College Park East

21/5

U/F1/1

21.5.86

8

14 APR 1986

For consideration by the Area Executive Team ~~Committee~~

To: Dr. McKenna / Miss Hanna.

on 18th April, 1986

SUBJECT:

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P.T.O.

SUBMITTED: GRO-C DATE: 10.4.86. APPROVED: DATE:

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AO/Planning
AO/A

To: Miss Hanna AO/A

For appropriate action please, in accordance with Committee's decision.

- Separate A/s to Miss Hanna AO/Pe.

GRO-C

DATE:

U/M50/50

NEW REGIONAL BLOOD TRANSFUSION CENTRE

Operational Policy and Schedule of Accommodation

General Principles

The Northern Ireland Blood Transfusion Service is a regional service supplying the needs of the entire province which has a population of 1.5 million. The service is administered by the Eastern Health and Social Services Board and is under the direction and control of a Medical Director.

Functions

The functions of the Service can be considered under the following general headings.

1. Collection, testing and distribution of blood to meet the requirements of all the hospitals in the province - also the preparation, testing and distribution of blood components to meet the needs of all hospitals and clinics. These are the primary functions of the Service.
2. Ante-natal service
3. Blood Group Reference Laboratory
4. Tissue Typing Service
5. Teaching and Research

Each of these functions will be expanded on as follows:-

1. (a) Routine blood collection. The programme for collection of routine blood donations is the responsibility of the Organising Secretary and his staff. This involves arranging donation sessions at appropriate venues throughout the province, call-up of donors to sessions, maintenance of records on each donor, arranging badge presentations and the maintenance of appropriate statistics. At present 3 blood collection teams are in

operation on five days per week. It is likely that a fourth team will be requir in the foreseeable future to meet the increasing demand for blood and blood prod Each team consists of a Medical Officer, approximately ten donor attendants 'supervised by a team leader) two clerks, two drivers and one porter. The staff travel to sessions by mini-bus or coach and equipment is transported in a separat vehicle.

At present approximately 67,000 donations are collected annually but this is likel to rise to 75,000 in the next 3-5 years and ultimately to 85-90,000 units per year A manual system is used to maintain the present donor records using individual cards for each donor, but this is likely to be replaced in the near future by a computerised system.

1. (b) Specialised blood collection. In addition to routine blood donations a number of donations must be collected using specialised techniques, (these must be performed at the Regional Transfusion Centre). These techniques include plasmapheresis, which is used to collect plasma from donors who have particularly valuable antibodies identified by laboratory screening, eg anti-D and many other hyperimmune plasmas. This plasma is used to produce specific immunoglobulins. Mechanical cell separators would be used to collect white cells from a specially recruited panel of donors.

In addition to collection of white cells it is now very likely that mechanical cell separators will be introduced for the collection of routine blood components eg platelets and plasma. The demand for these components has increased enormously and this combined with the recent advances in cell separator technology, which make their use much more cost effective, means that future planning should budget for the installation of several such machines.

1. (c) Testing of blood donations. The following tests are performed routinely on all donations.

(i) Full blood typing of all donations and ensuring that each unit is labelled with the correct blood group.

(ii) Testing all donations for the prevention of transmissible diseases including hepatitis B, syphilis, and others where appropriate eg cytomegalovirus infection. The number of tests will increase in the near future particularly whe a test for carriers of Non-A, Non-B hepatitis becomes available. One important additional test, likely to be introduced in the near future is HTLV-III antibody, with a view to preventing the spread of the Acquired Immune Deficiency Syndrome (AIDS).

1. (d) Preparation of blood components. The following blood components are prepared in the Centre -washed red cells, leucocyte-poor red cells, platelet concentrates, cryoprecipitate, fresh frozen plasma and other types of special plas are collected and transported to the Protein Fractionation Centre, Edinburgh for production of albumin solutions, Factor VIII concentrates, and other coagulation concentrates and a variety of immunoglobulins. Appropriate quality control testing to determine the efficacy and safety of these blood components must be carried out. All these components in addition to whole blood are distributed to hospital blood banks, pharmacies, etc as required. In addition to those blood produ which are parpared within the Transfusion Service the NIBTS is now responsible for the ordering and issue of blood products from non-NHS or commercial sources.

2. Ante-Natal Service. Blood samples are received from all ante-natal patients in the province. Full blood typing is performed and also tests for the prediction and monitoring of haemolytic disease of the newborn. In addition screening for immunity to Rubella is performed on all specimens so that non-immune subjects thus identified can be offered vaccination. In addition to red cell serology and rubella screening, the NIBTS also screens all ante-natal patients for Hepatitis B markers enabling babies born to HBsAg positive mothers to receive prophylaxis as appropriate to prevent this "carrier state".

3. Blood Group Reference Laboratory. This laboratory performs specialised investigations of problems associated with the administration of blood and of certain types of immunohaematological diseases. This involves the maintenance

of a comprehensive panel of rare blood types and the use of specialised tests fo the detection of platelet antibodies, white cell antibodies and plasma protein antibodies. The Reference Laboratory also supplies hospital blood banks with many laboratory reagents for blood group testing. This Department is also respor sible for the laboratory aspects of a programme for procurement and production of anti-D immunoglobulin.

4. Tissue Typing Service. It is envisaged that the Regional Tissue Typing Service would be accommodated within a new Transfusion Centre. Routine HLA Typing plays an important part in the investigation of a wide range of diseases. In organ transplantation HLA Typing is used to match donor with recipient. This service also helps with the provision of HLA matched blood products from the Transfusion Centre.

5. Teaching and Research. The teaching commitment includes basic practical and theoretical instruction in Blood Transfusion to medical students and more advanced level training for MLSO's and doctors studying for the MRCPath.

Research and development is an integral part of each laboratory although only a limited amount of research is carried out at present. Research in the future should be directed towards (a) production of new and more effective blood components and their assessment in vivo, (b) more cost effective methods for the procurement of blood and blood components, (c) reduction of hazards associated with transfusion of blood and blood components, (d) improved techniques for investigation of immunohaematological disorders.

Departments and Sections of the Transfusion Centre.

The functions referred to depend on several different departments and sections. There will be described individually but are of course closely inter-related in their organisation and pattern of work. The departments are described with particular reference to any special requirements of their accommodation.

Donor Panel Department and General Administration

Both of these sections is under the supervi-

panel department is responsible under the Donor Organiser and his staff for arranging blood donation sessions, publicity in connection with recruitment of blood donors, informing existing donors about sessions, maintenance of record on all donors and donations and organising bade presentations. Office and sotra accommodation for this department is summarised under "Schedule of Accommodation

The General Administration Department is responsible for the following:-

(a) Transport - this includes supervision of drivers and porters, arranging for the regular maintenance of the 10 BTS vehicles. This section is responsible for transport of staff and equipment to and from blood donation sessions, routine and emergency delivery of blood and blood products to hospitals and delivery and collection of blood products to and from the Protein Fractionation Centre, Edinbu

(b) Stores - a stores officer is employed for ordering, receiving, storing and distribution of all supplies used by the Centre. Storage facilities are required to be sited close to a loading bay.

(c) Maintenance of building - this department is responsible for ensuring that al necessary repairs and maintenance are carried out (by either District or Area Works and Maintenance Department).

(d) Miscellaneous functions - eg maintenance of staff records, responsibility for petty cash, etc.

Blood Donor Unit

Separate but adjacent areas would be required for routine blood donation sessions and for specialised donation procedures (plasmapheresis and cell separation). Tehse areas should be sited beside the main entrance for the convenience of donors. The Nursing Unit and an office for Medical Officers should be sited nearby.

Donors proceed from the Waiting Area to the bleeding/plasmapheresis rooms while documentation and haemoglobin tests are carried out prior to donation. After blood donation, donors rest on couches and then receive refreshments in the Tea Room. Donors return to the Reception Desk to receive the completed record cards

prior to leaving the Centre. Routine blood donors are detained for about thirty minutes in all and plasmapheresis/cell separator donors for 1½-3 hours depending on the procedure.

Nursing Unit

This unit is under the control of the Nursing Sister and at present has 40 donor attendants. Eventually an extra session team in addition to increasing plasmapheresis/cell separator functions would increase the number to about 55.

Donor attendants are trained here and session equipment is prepared and stored here prior to loading into vans. A changing room with lockers is also needed for the donor attendants. Laundry facilities could be provided by the hospital laundry as at present. The hospital CSSD Department could also provide the necessary sterile swabs.

Stores

The Centre is responsible for storage of all materials and equipment and this function is under the control of a Stores Officer. Loading bays are necessary for vehicles serving blood bank, stores and nursing unit. Accommodation for general stores and also that for blood donor sessional equipment should be sited close to the loading bay. A despatch room sited near the loading bay is required in which equipment prepared for individual sessions is placed prior to collection.

Transport

The Centre uses its own vehicles for most purposes which include transport of staff and equipment to blood donation sessions, collection of certain blood donors, supplies of blood and blood products to hospitals throughout the province and transport of plasma to the Protein Fractionation Centre, Edinburgh. No indoor accommodation is available at present for the 10 vehicles which are in use at present. It would be desirable but not essential to have garages provided adjacent to the centre. If available space on the site does not permit

this, alternative premises which are convenient to the Centre would be satisfactory.

Medical Staff

Medical Staff require suitable office accommodation. The Director and Deputy Director each have Personal Secretaries, who should be accommodated in adjacent offices. Provision should also be made for a third consultant who may be required in the future. An office and small laboratory should be provided for sessional medical officers and similar accommodation for registrars. An Examination Room should be provided for interviewing and examining donors.

The Laboratories

This department is under the immediate control of a Senior Chief Medical Laboratory Scientific Officer. At present it is divided into six sections each under the control of a Chief MLSO as follows:
Donor Grouping Laboratory, Blood Bank (with a sub-section concerned with quality control), Ante-natal Laboratory, Blood Group Reference Laboratory with a sub-section concerned with a reagent production, Rubella Laboratory and Hepatitis Laboratory. It is envisaged that the New Centre would incorporate the present function of Tissue Typing which is at present sited at the Belfast City Hospital. The Laboratories must be designed in accordance with Good Manufacturing Practice and meet the requirements of the Medicine's Inspectorate of the DHSS. It must also be planned to meet the requirement of the Health and Safety at Work Act and also the Howie Code of Practice.

Regarding the lay-out of the Laboratories certain general points should be applied.

(a) Blood Bank and Blood Issue should be adjacent to a point of entry to the building.

(b) It is in the interest of efficiency that certain laboratory sections

should be sited close together thus the Blood Bank must be convenient to the Donor Laboratory and Hepatitis Laboratory. The Donor Laboratory should be convenient to the Ante-natal Department which in turn should be convenient to the Rubella Laboratory.

The requirements of each section of the Laboratory are as follows:

Donor Grouping Laboratory

This function can be accommodated within one large laboratory. It is concerned with comprehensive blood group typing of all blood donations collected. Much of this work is carried out by an automatic blood grouping machine which also tests for unwanted red cell antibodies, "dangerous Group O donations" and syphilis serology. Any doubtful results are checked by detailed manual testing.

Ante-natal Department

This department requires a laboratory, an office and a separate specimen reception area. Blood samples are received from all ante-natal patients in the province (approximately 40,000 samples per year). These blood grouping tests play a fundamental part in the prevention and treatment of haemolytic disease of the new-born (HDN). Each ante-natal patient is issued with a record card containing ABO and Rhesus(D) type. All cases are screened for the presence of antibodies which may have significance in causing HDN. Patients with antibodies are monitored in order to predict the severity of HDN so that appropriate obstetric action can be taken. Records are maintained for ante-natal patients for varying periods depending on the category involved. Storage of information would be greatly facilited in future by the introduction of a computerised system. This laboratory would also perform tests associated with the immunisation of volunteers for the purpose of anti-D production (used in the prevention of HDN). The department also provides a Regional service for platelet antibody detection. The office attached to the Ante-natal Department could also accommodate the clerical needs of the Rubella Laborato-

Rubella Laboratory

Blood samples received by the Ante-natal Laboratory are also tested for immunity to Rubella. Samples from female donors and specifically requested samples are also tested. Results are notified to the appropriate clinic so that vaccination can be offered to those who are non-immune. Record cards are maintained on all non immune subjects and a computerised system would in future be of great value particularly to avoid unnecessary repeat testing. This laboratory also carries out testing of certain blood donations for antibody to cytomegalovirus (CMV) as it is important that CMV negative blood or blood products be given to certain types of patients.

Hepatitis Laboratory

This laboratory should be planned in accordance with the Howie Code of Practice and must have a separate area in which staff change before entering the Laboratory. This section is concerned with testing of all donations for hepatitis B antigen so that positive donations can be excluded. All ante-natal patients are also tested and advice given regarding the prevention of transmission of the virus to babies eg by the use of hepatitis immunoglobulin and vaccine. This laboratory uses radioisotopes and a fume cabinet requires to be installed. Provision should also be made for Non-A, Non-B hepatitis testing of all conations when this becomes available. The Hepatitis Laboratory also screens donations for the presence of high titre antibodies to certain infections eg hepatitis B, tetanus, Varicella-Zoster etc. The plasma from such donations is used for the production of specific immunoglobulins which is used for the prevention of appropriate infections. The range of these specific immunoglobulins is likely to increase greatly in the future and provision should be made for expansion. It would seem appropriate that HTLV-III antibody testing be carried out in this laboratory, particularly as the Health and Safety Aspects are similar to those which apply to Hepatitis B testing.

Reference Laboratory

In contrast to most of the other laboratory sections which handle a large throughput of specimens this section is concerned with extensive and

detailed investigations of blood transfusion associated problems referred from all hospitals in the province. These include investigation of transfusion reactions, identification of the less common red cell antibodies and finding suitable blood for such patients. Specialised tests such as those forprotein and white cell antibodies are necessary. The maintenance of a large panel of cell types including many rare blood groups is necessary. Certain blood group genetic tests are carried out. A sub-section of the Reference Laboratory is concerned with the production of laboratory reagents and should be accommodated in a separate area. Many of the reagents used in the Centre come from human blood and this sub-section is concerned with screening and testing blood donations in order to find suitable serum for reagent production. In addition to supplying the needs of the Centre the hospitals blood banks are also supplied with reagents. A convenient deep-freeze room is necessary for the storage of these reagents.

Blood Bank

This section contains a number of sub-sections which could be considered separately.

(a) Blood processing and storage

All blood donations collected by the Service are stored under appropriate conditions in this section. An increasing proportion of blood is processed for the production of an increasing range of blood components which require to be stored under varying conditions depending on the type of component. Storage areas containing efficient monitoring and alarm systems must thus be provided. Some blood components are produced at the Transfusion Centre itself while others are produced by the Protein Fractionation Centre, Edinburgh using plasma supplied by the Transfusion Centre as raw material. It is essential that sterility is maintained during separation of blood components and appropriate environmental conditions must be such as to allow this. An area sufficient to accommodate about 15 refrigerated centrifuges in addition to separation and freezing equipment is necessary for most routine separation.

Blood processing which involves "open methods" must be performed in a specially designed asceptic suite which meets the requirements of the Medicine Inspectorate of the DHSS. A separate cryopreservation area would be required for the preservation of red cell, platelets and other cellular components in liquid nitrogen containers.

(b) Records and Blood Issue

When all tests have been completed on the day following blood collection the Blood Bank is responsible for checking that all blood and blood components have been correctly labelled. Blood and blood components are issued from this section to the various hospitals as required and records kept for each unit issued. Inventory control would be assisted greatly by the introduction of a computerised system using bar code labels to identify each blood unit.

(c) Quality Control

In order to ensure that preparation methods and storage conditions are optimum for each blood component, regular quality control tests are necessary. It is hoped that this section would in future become administratively distinct from the Production Department and a separate area should be provided. This would include Coagulation and Bacteriology Laboratories.

(d) Cross-matching Laboratory

A Cross-matching Laboratory should be sited close to the Blood Bank. The size of this laboratory would depend on its function. If used only for emergency cases a small laboratory only would be necessary. However if the BTS were sited within a large hospital there may be a case in the future for rationalisation of the hospital Blood Bank function so that the routine Cross-matching became the responsibility of the Transfusion Centre. The latter alternative would of course require a large department. This sub-section

should have a small room nearby for the MLSO "on-call" in which to make and drink beverages.

(e) Tissue Typing Laboratory

This would be a Regional Service and perform routine HLA typing for all hospitals inthe province. This section would liase closely with Renal and other transplantation units. It would also perform typing relating to the provision of HLA matched platelets and white cells for transfusion. This laboratory can be fairly self-sufficient in laboratory reagents by screening blood samples received from ante-natal patients which are the main source of such reagents. In addition to the main laboratory separate areas would be needed for cell culture techniques, storage of reagents in liquid nitrogen and storage of records.

(f) Immunology and Protein Chemistry

Future developments in the field of blood transfusion will require the presence of small immunology and protein chemistry laboratories and this would preferably be sited close to the Tissue Typing Laboratory. The provision of IgA deficient blood for IgA deficient patients is a currently available service. In the near future the use of blood products for the correction of immune defects is a likely developing field and this would involve pre-transfusion testing of patients as well as quality control testing of the blood products used.

(g) Autoclave/Wash-up/Stills

This section would serve the needs of the whole Centre and the siting is not critical. Much glass-ware and sample tubes are re-cycled requiring to be washed and in some cases autoclaved. All hepatitis-positive material must be autoclaved prior to disposal. At present three stills are in use for the production of distilled water which in turn is used for the

production of various crystalloid solutions which are used in the laboratory. The need is likely to continue although itmay be that future requirements for sterile solutions will be met by a Central Sterile Fluids Production Unit.

(h) Teaching and Research

A teaching laboratory with benches sufficient to accommodate about 20 students would be required. The latter would include MLSOs, medical students and doctors specialising in Laboratory Medicine.

At least one Research Laboratory should be provided with a small office adjacent.

(i) Domestic Services

Cleaners rooms are necessary on each floor of the Centre and also changing and locker facilities for the cleaners.

(j) Catering, Common Rooms and Toilets

If theCentre is located in a hospital site full canteen facilities are unnecessary. Rest-Room/Coffee Room facilities would be necessary for certain groups of staff. A Rest Room and Changing Room are needed for donor attendants and sited close to the Nursing Unit. A Rest Room is required for MLSOs and scientific staff close to the laboratories. Lockers facilities for laboratory staff should be provided in close association with the laboratories in accordance with the Howie Code of Practice. Toilets to serve 40 male and 60 female staff are required. An additional rest room should be provided for drivers and porters.

Instead of separate rest areas for various groups of staff, it may well be preferable to have a communal rest area for the use of all staff.

(k) Car-Parking

Separate areas are required for staff cars (60 places) and donor cars (10 places). The area for donors cars should be sited as near as possible to the entranc

Access to the site

Traffic associated with the Centre would fall into the following main categories.

(i) Staff, donors and visitors to the main entrance

(ii) Goods vehicles to the stores loading bay

(iii) Session vehicles to the Nursing Unit loading bay.

The Blood Bank, Stores and Nursing Units should be related to the loading bay.

(m) Public Telephones

Public telephones are required, one on each floor.

(n) Engineering Services

(a) Mechanical services

(i) A boiler house containing boilers for heating and hot water storage is required. Steam generators not required.

(ii) Refrigeration. Several cold rooms, including some with deep-freeze facilities are needed. Special consideration of alarm systems will be required.

Special consideration may be needed for ventilation of laboratories and autoclave room. Heating was not considered in detail but special consideration of methods of control in laboratories may be necessary. Water supply is again not considered in detail but there may be a requirement for storage tank of at least a day's supply.

(b) Electrical services

This is not considered in detail but an emergency generator must be provided to serve the essential services.

(c) Telephones.

The Centre would have its own switch-board.

Future expansion

It is very difficult to predict the future developments in the field of Blood

Transfusion and it is essential that planning of the Centre allows sufficient flexability to accommodate future expansion.

14th October 1982

NIBTS - DEFICIENCIES IN THE PRESENT HEADQUARTERS PREMISES

The NIBTS was transferred from the Belfast City Hospital to its present location at Durham Street in 1969. At that time it was envisaged that this would be a temporary measure to cover a ten year period, by which time it was planned that a new purpose-designed Transfusion Centre would be built on the site of a major teaching hospital.

For many reasons, the present building has become grossly inadequate as well as having a very unsatisfactory location. These deficiencies will be considered under the following headings:

1. SELF SUFFICIENCY IN BLOOD AND BLOOD PRODUCTS
2. SAFETY OF BLOOD AND BLOOD PRODUCTS
3. WORKING CONDITIONS
4. STORAGE SPACE
5. DIAGNOSTIC TESTING OF PATIENTS
6. TEACHING AND RESEARCH
7. LOCATION

1. SELF-SUFFICIENCY IN BLOOD AND BLOOD PRODUCTS

The practice of blood transfusion has undergone a dramatic change during the past 10 years or so. Prior to this the vast majority of the units of blood collected from donors were issued to hospitals and transfused as whole blood. Now, as a result of demands from several medical specialities combined with advances in the technology for processing blood, over 80% of blood collected is converted into separate components (each unit donated may contribute to as many as 6 different components). Some components are produced at the Transfusion Centre and some at the Protein Fractionation Centre, Edinburgh using source plasma supplied by the NIBTS. The demand for blood components has been rising so rapidly that present blood collection (adequate for ordinary blood transfusion purposes) is unable to sustain it. It is partly for this reason that a proportion of certain blood products, notably Factor VIII (haemaphilia treatment) and various albumin products have had to be imported from commercial sources (as in the rest of the UK). The source of blood plasma from which these imported products are made, is paid donors usually from the USA, but in some cases from underdeveloped countries. The practice of importing blood products is undesirable for the following reasons:

1. Cost - commerical products are more expensive than the NHS equivalent.
2. Patient safety - the risk of transfusion transmitted diseases, e.g. AIDS, hepatitis, etc., is less with NHS products.
3. Ethical reasons - this relates to the intensive collection of blood plasma which is practised by commercial companies in a way that may be deleterious to

the health of donors (often the poorest and least well-nourished) and in some cases jeopardise blood collection in countries which are already in very short supply.

For these reasons the WHO have strongly recommended that all countries should strive to become self-sufficient in all blood products - this principal is accepted by all Western Governments. The goal of self-sufficiency is a receding one because of the rapid and continuing increase in demand. If it is to be achieved, new stratagies are required in order to collect sufficient quantities of source plasma. This would involve setting up a plasmapheresis unit for donors - (using plasmapheresis 5-10 times as much plasma per donor per annum can be collected).

Present deficiencies

1. There is insufficient space to set up a plasmapheresis unit which should be based at the Transfusion Centre.
2. Much more laboratory space is needed to allow additional processing, refrigeration, etc, of plasma.

2. SAFETY OF BLOOD AND BLOOD PRODUCTS

It is clearly essential to ensure that therapeutic blood products are effective when transfused and are sterile and free from side-effects. As producers of such products, Transfusion Centres must comply with requirements of the Medicines Act. These requirements are enforced by the Medicines Inspectorate. The latter have been highly critical of the present NIBTS accommodation and have clearly stated that minimum standards would be impossible to achieve due to lack of adequate space in these premises. In this regard the most serious deficiencies include:

1. Lack of a properly controlled aseptic area in which procedures, liable to cause contamination of blood products are performed.
2. Lack of a quality control laboratory in which testing designed to ensure that minimum standards are being adhered to.

3. WORKING CONDITIONS

Most of the staff have had to work in extremely cramped conditions over the years but recently this problem has reached crisis proportions. In order to maintain essential laboratory services, certain areas, e.g. Medical Officers room, donor attendants changing room, etc., have had to be taken over and used as laboratories. Inspite of these measures, existing laboratories have become grossly overcrowded with equipment which in a number of cases is overflowing into corridors. The problem is compounded by very inadequate storage space. Apart from the cramped conditions, a number of other serious problems exist:-

a. Safety from infection, e.g. hepatitis, AIDS. The lack of space precludes the possibility of even approaching the recommendations of the Howey Code of Practice. Extreme examples are found in those areas where testing for AIDS and hepatitis is carried out in which there is insufficient space to install safety cabinets. Separate changing areas should also be provided for the hepatitis/AIDS testing laboratories. A reception area for specimens, separate from the testing area should be provided for several laboratories. Even proper hand-washing facilities cannot be provided in some laboratories due to lack of space.

b. Overheating. Refrigerated centrifuges and deep freezes produce heat when operating. In view of the large quantity of this equipment which is concentrated in a small area (separation area) very high environmental temperatures are reached which is most unpleasant for staff.

c. Fire risk. Most of the corridors are cluttered and partially obstructed with various items - chest freezers, filing cabinets, office and laboratory supplies, office equipment (enveloper, photocopier and stencilling equipment). This has drawn frequent criticism from fire advisors.

d. Noise. The office equipment referred to above is operated in a corrider and causes an unacceptable level of noise for various personnel.

e. Recreation area. As already noted most of the pre-existing recreation areas have been taken over for additional lab space. The tiny areas which remain for this purpose are of a quite appalling standard.

f. Car Parking. There is now such congestion in the car parks that staff are frequently being interrupted during the working day to move their car. This problem has become even worse following erection of a portacabin in the car park. It is particularly unfortunate as visiting donors find it virtually impossible to find a parking space.

4. STORAGE SPACE

General storage space is grossly inadequate and a high proportion of supplies must be held outside the Centre. Furthermore large quantitites of office and laboratory supplies are to be found in corriders, reception areas, etc.

Storage of records is adversely affected. It is necessary to retain details of all donations for at least 10 years. These are housed in a small dark attic which is almost inaccessable and details of records are often extremely difficult to locate when required due to the lack of suitable accommodation.

Cold storage rooms (housing blood products and reagents) are grossly overcrowded. This aspect together with inadequate space for storage of non-refrigerated blood products has also been severely criticised by the Medicines Inspectorate.

5. IMPROVED PATIENT TESTING FACILITIES

Almost half the laboratory staff are engaged in testing of patient blood samples (includes all ante-natal patients in the Province, cum investigation of certain types of blood disorders and investigation of the causes of problems associated with blood transfusion in hospitals). In this area more accurate diagnostic assistance and improved monitoring of certain patient disorders could be provided given better facilities and more spacious accommodation.

A specific area recommended by the DHSS document dealing with the provision of laboratory services (1982) is the incorporation of the Northern Ireland Tissue Typing Service (now sited at BCH) as part of the NIBTS. Such a link-up would be of mutual benefit to the two services.

6. TEACHING AND RESEARCH

Several types and grades of staff are required to visit the Transfusion Centre for theorectical and practical instruction in various aspects of transfusion medicine, e.g. medical students, doctors at various stages of training, blood bank laboratory staff from all hospitals in the Province, and nurses from certain specialities. A major defect is the complete absence of a separate area for teaching. This makes it virtually impossible to deal with large groups or to hold practical classes. A lecture room, equipped to enable practical instruction in various laboratory procedures, is a necessity.

A further important deficiency is a complete lack of any library or facility suitable for private study. While most relevant journals are taken these must at present be retained in the offices of senior personnel to which access may be limited.

Research activities in the premises is severely restricted by lack of facilities. While research is of secondary importance when compared to the service committment it does play a vitally important part in maintaining interest and stimulation among medical and laboratory staff. Apart from this aspect, every MLSO who sits for the FIMLS qualification is required to carry out a research project. The latter has proved to be very difficult because of the many deficiencies referred to above.

7. LOCATION

The present location at Durham Street is unsuitable for a variety of reasons.

a. Security - the premises have been subject to repeated vandalism and break-ins. A prime concern has been staff safety especially to those who provide an "on-call" service at night. In addition to one very serious shooting incident, other members of staff have been subjected to harrassment and attack on occasions. Furthermore, theft, damage to staff cars and damage to property and equipment have been regular occurrences - reports of such incidents are received about once a fortnight.

b. Blood donors - the present location represents a serious deterrent to members of the public attending to give blood. The existing permanent city centre donor session is an alternative site, but an important drawback at this centre is the absence of any car parking facility nearby. Furthermore, it is essential that a plasmapheresis unit is located at Headquarters and also that the latter can hold emergency blood donor sessions when required.

c. Teaching hospital - the DHSS (NI) Report on provision of laboratory services 1982, made a strong recommendation that a new Transfusion Centre should be located on the site of a major teaching hospital. This would allow the transfusion centre to be more actively involved in patient care (usage of blood products, diagnostic testing including Tissue Typing and direct patient treatment (cell separators). This aspect is discussed in some detail in the accompanying notes - "Location of New Blood Transfusion Centre".

1. General Administration

An office currently occupied by an HCO in general administration has been omitted from the present accommodation.

Our General Administrative Officer (recently established post) who oversees the donor panel clerks does not at present have a separate office.

2. Donor Panel Department

Donor panel clerks - the existing accommodation is inadequate in area.
General Administrative Officer - see above.
Poster store - at present publicity material is stored in offices, corriders, reception area, or whereever space can be found.

3. Teaching

All grades of staff receive training - doctors, medical students, MLSOs and other laboratory staff, donor attendants, etc. It is estimated that on average about 2 sessions per week is taken up with this task. The numbers involved could vary from 2-20 at each session.

4. Medical Staff

The average transfusion centre in GB had 3-4 consultants. There are no immediate plans to appoint a third consultant but this should be budgeted for in the new centre.

Office for Medical Officer - the former medical officer's room had to be taken over for an additional laboratory some four years ago. This is required particularly for two full-time associate specialists for various administrative duties, e.g. correspondence with donors, organising of duty rosters, etc.

Registrar's room - the Royal College of Pathologists now require all haematology trainees to spend 6 months in a blood Transfusion Centre so that at most times a Reg/SR is based at the BTS.

Examination Room - facilities should be provided to enable full physical examinations to be carried out. This is necessary before certain categories of special donors can be accepted, e.g. for cell separator and certain donors who require to be immunised before embarking on a plasmapheresis programme. Physical examination is also a necessary part of the initial conselling of certain donors who are found to have abnormalities, e.g. AIDS, hepatitis, etc. It is also occasionally necessary to examine members of staff.

It is necessary to cater for a substantial plasmapheresis unit. Present facilities are sufficient for a small conventional donor session (bleeding 3-4 donors at a time). The plasmapheresis unit would require much more space because it is envisaged that eventually 6-8 machines would be operating simultaneously each one requiring more space than for ordinary blood donation.

The new donor centre at College Street/Linenhall Street would cater for most of the conventional donations for Belfast.

6. Nursing Unit

Donor attendants are responsible for preparing various items of equipment used for donor sessions, e.g. labelling all specimen tubes, dispensing same with appropriate solutions. These functions would be carried out in the preparation room.

All medical equipment required for donor sessions will be issued from a despatch room. This area would also be used for preparing various items of donor session equipment (by laboratory assistants) including those which require to be sterilized, as well as various disposables.

The areas for both despatch and preparation rooms could be reduced to 30M².

7. Donor testing

Testing for AIDS antibody as well as hepatitis B would be carried out in hepatitis I. It should be noted that the major cause of post-transfusion hepatitis is nonA-nonB hepatitis. It is likely that donor screening tests for the viruses which cause this problem will be introduced in the fairly near future.

The lack of safety cabinets and a separate changing area in the hepatitis labs. represents a hazard to staff who have to deal with materials potentially infected with AIDS and hepatitis as well as using radioisotopes.

Hepatitis II would be used to test for hyperimmune plasma which in turn is used to make various specific immunoglobulins. These are used to treat and prevent specific infections in appropriate patients, e.g. anti-tetanus, anti-hepatitis B, etc. This is a very important growth area and many new specific immunoglobulins are being introduced for the benefit of patients.

8. Blood Bank

At present 6 MLSOs and 3 Lab.Assistants are employed in the Blood Bank and blood

processing areas

Blood processing (more correctly preparation lab.) - this function is presently carried out in the same area where autoclaves are operated. The functions include the preparation of various solutions and reagents for use in all the laboratories (by lab. assistants) and should have a separate area.

Cross-matching laboratory - the requirements for this laboratory depend on the siting of the new Transfusion Centre. If on a hospital site, and it was considered appropriate, the Transfusion Centre could provide a cross-matching service directly for the patients in the hospital concerned (acting as a hospital Blood Bank).

9. Blood Group Reference Lab.

There is a deep-freeze room at present serving this laboratory which was not recorded on the original schedule of accommodation.

The Ref.Lab. covers two distinct functions, (1) providing a reference testing service for hospitals and (2) provision of blood group reagents for use in the Transfusion Centre and all hospitals. There is a need for the total area of these functions to be increased substantially because of existing congestion as well as allowing for future expansion (new tests and new reagents). Given this additional space, it may be satisfactory to continue housing both functions in one laboratory.

10. Tissue Typing

This service is presently sited at the Belfast City Hospital and is discussed under "Deficiencies in NIBTS". A physical but not necessarily administrative link-up between the BTS and Tissue Typing is recommended in the DHSS Policy for Provision of Lab. Services. This aspect will clearly require discussion with personnel concerned before detailed planning can begin. It is envisaged that the existing Tissue Typing staff at the BCH would move into this section.

11. Other areas

Teaching and research is dealt with under "Deficiencies in NIBTS".

The Dark Room is required for immunofluorescent work (currently carried out in a makeshift cabinet). The other areas referred to will be required for predicted future developments.

1. FUNCTIONS OF THE BLOOD TRANSFUSION SERVICE

Some of the basic tasks of the BTS namely collection of blood from donors and its distribution to hospitals after appropriate testing, is well-known. The work of the Service is actually very wide-ranging and the speciality of transfusion medicine is a fast developing one, the practice of which requires close collaboration between the Transfusion Centre and many different clinical specialities. The following points should serve to illustrate this.

Blood component therapy

Blood transfusion therapy has changed dramatically in recent years so that instead of transfusing whole blood to most patients the practice is to use individual components of the blood which are prepared by the Transfusion Centre. The clinical demand for blood components has increased dramatically both in range and quantity. To meet this demand the majority of blood donations (75%) are now processed (often several components are extracted from each donation). Furthermore, several blood components must be prepared from donors who are specially selected by prior laboratory testing.

Around 20 different blood components are currently issued to hospitals from the NIBTS and several new ones are on the way. Before being introduced new blood products must be assessed for their therapeutic value and safety in patients and this assessment is continued thereafter. This process requires close collaboration between hospital users and staff in the Transfusion Centre.

A great deal of effort is being made to ensure that blood component therapy which plays such a vital role in the treatment of a wide range of diseases, is as free of side effects as possible. This is helped by the performance of blood tests designed to detect infectious agents in donor blood e.g. hepatitis, syphilis, AIDS and others.

Patient testing

Apart from performing tests on the blood of donors the BTS has responsibility for carrying out a variety of blood tests from patients all over the Province. Blood samples are received from all pregnant women in Northern Ireland. These tests play a vital role in the prevention, in the offspring, of the Rhesus problem, hepatitis and congenital abnormalities due to rubella.

The Reference Lab. receives blood samples from hospital Blood Banks for the purpose of investigating difficulties and side effects associated with transfusion therapy. This laboratory also carries out specialized tests and investigations on patients with certain types of blood diseases.

2. DHSS (NI) REPORT ON PROVISION OF LABORATORY SERVICES (1982)

This Report made recommendations which are relevant to the future siting of the Transfusion Centre. First of all, it was recommended that hospital laboratory facilitie in general, should infuture be concentrated within 6 sites covering the whole of NI. In particular, it recommended that the Transfusion Centre should be sited within a major teaching hospital campus and furthermore that the transfusion Centre should be organised jointly with the Tissue Typing Service (based at the BCH).

3. WHY A TEACHING HOSPITAL?

There are many advantages in having a Transfusion Centre sited within a major teaching hospital. For reasons that should become clear the most suitable hospital is one which contains as many of the regional specialities as possible, in which transfusion therapy plays an important part (RVH or BCH). The advantages are as follows:

a. Blood component therapy

The rapid developments in this field are discussed above. The production of the most effective and safe blood components for therapeutic use is best achieved when there is active and close collaboration between the producers (in the Transfusion Centre) and clinical users. Physical isolation from hospitals makes such collaboration difficult to achieve in practice. Virtually all blood components produced by the NIBTS are used in the BCH and it is envisaged that particularly fruitful links could be established with the Haematology Unit (management of leukaemia and bleeding disorders), Transplant Unit (Renal and ?Bone Marrow) and the Obstetric and Neo-natal Units.

b. Cell-separators

An important recent trend in Transfusion Centres which will undoubtedly increase in the future is the use of blood cell-separators. These machines are used to separate blood components (plasma or cells) from donors at the bed-side (the remainder of the blood being transfused back to the donor). The very marked increase in demand for blood components (as opposed to whole blood) makes this procedure attractive and cost-effective especially for selected donors. Indeed, it has been carried out by non-mechanical means at Durham Street for several years. For some of the new machines, although considered extremely safe, it is recommended they should be sited close to resuscitation facilities.

In addition cell-separators are now being used for therapeutic management of patients (removing unwanted substances or components from the patient's blood). This is already established therapy for certain conditions (the only machine in NI is based at the RVH) but new uses are being found for this type of therapy especially now that rapid improvements in the technology are taking place. A number of Transfusion Centres

in the UK have become directly involved in patient therapy using these devices.

It is thus envisaged that blood cell-separators would in future be installed at the Transfusion Centre at BCH serving the dual purposes of blood component collection and direct patient therapy.

c. Tissue typing

For a variety of technical reasons, as recommended in the DHSS Policy Report, there would be considerable mutual advantages in having the Tissue Typing Service organised jointly with the BTS. This link-up could be readily achieved, only if the Transfusion Centre were sited at the BCH (especially in view of the important links which currently exist between Tissue Typing and the Renal Transplant Unit).

d. Patient testing

The role of the Service in this area is described briefly above. By establishing closer links with clinical colleagues e.g. in the management of blood disorders and Rhesus and other obstetric problems, this service would become more effective.

e. Cost benefits

Siting of a new Transfusion Centre at BCH has potential cost benefits arising from the sharing of resources e.g. use of cell-separators, tissue typing service. Sharing of non-clinical facilities, e.g. engineering services, catering, etc, would presumably be also have cost advantages.

f. Access to other hospitals

The location of a Transfusion Centre in relation to other acute hospitals is of obvious importance especially when emergency blood supplies are required. The BCH site is within very easy reach of the RVH and its proximity to the Ring Road and the Motor Way would provide ready access to all the hospitals.

g. Staff

An important disadvantage of the present site is the existence of professional isolation of medical, nursing and laboratory staff. Re-siting on a major hospital site creates the potential for greater involvement of staff in patient care which would undoubtedly lead to improved morale and better recruitment.

Finally, it is widely acknowledged among medical transfusion staff in the UK that TCs should be sited in a major hospital. The majority of RTCs in the UK are so located including virtually all the leading centres.