# Transfusion and Cross-Matching

BY

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# LEARNING OBJECTIVES

- To identify the key elements in the current blood bank services.
- To appreciate the implemented measurements and standards for obtaining the highest quality in the blood bank services.
- To have a general idea about the donation process and main blood components.
- To understand the inheritance and significance of the ABO system.
- To understand the nature and significance of the Rh blood group system.
- To understand the cross-matching process, including the antiglobulin test.
- To have an overview about main hazards of blood transfusion.

# Blood Bank Units

- Traditionally, two parts:
  - 1) **Donation services**: donor area, component separation, infectious testing, ABO typing and RhD screening, inventory.
  - 2) **Transfusion services**: inventory, Patient (recipient) ABO grouping, RhD and antibody identification screening, cross-match, component issuing.
- Currently in the major hospital, there is a **apheresis** unit (donation, therapeutic or prophylaxis).
- In many tertiary hospitals, stem cell unit, cord blood unit and tissue banking.

# Donor Selection

**TABLE 5-1. Physical Examination and Requirements for Allogeneic and Autologous Whole-Blood Donation**

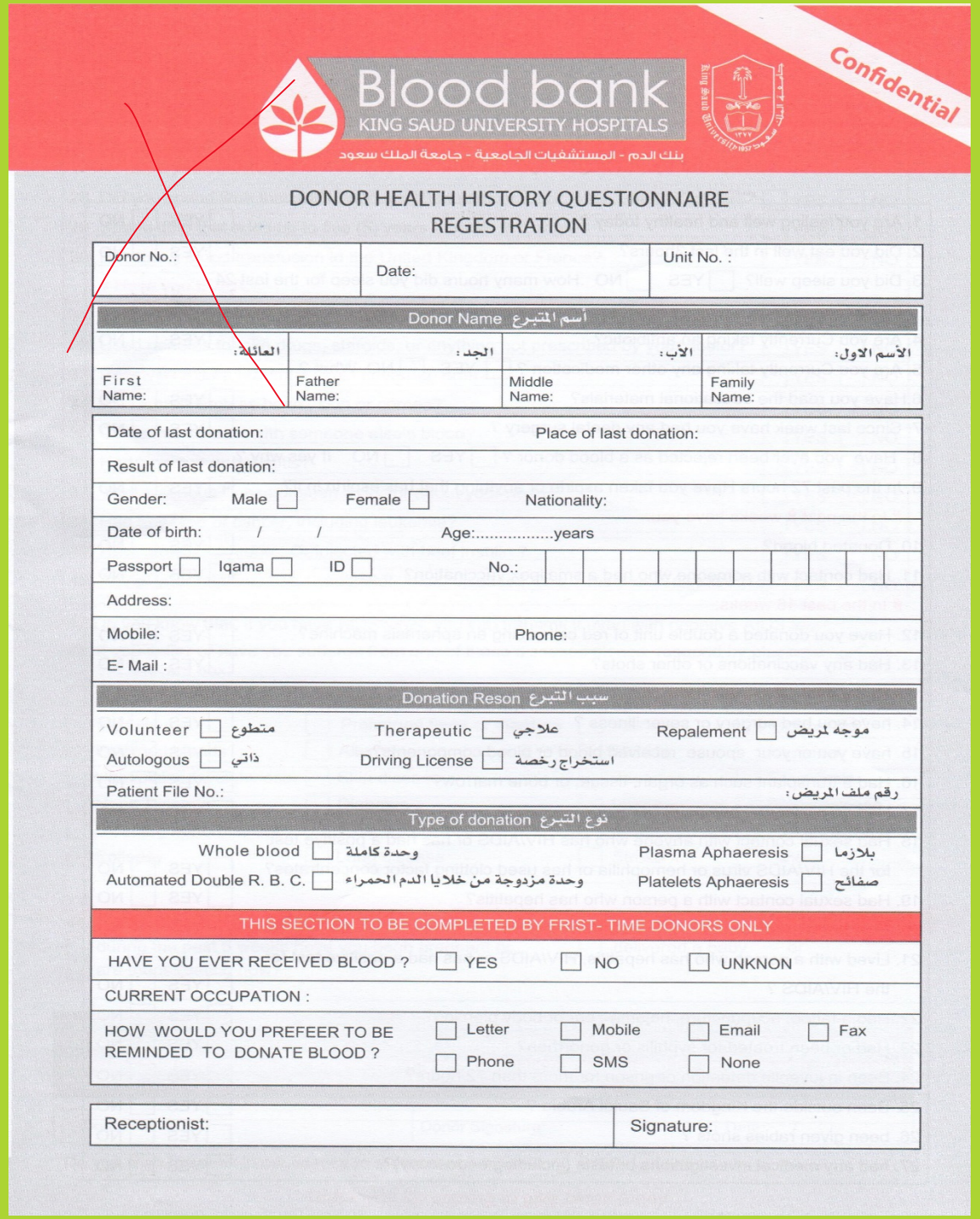
| | Allogeneic<br>AABB Reference Standard 5.4.1A; Title 21, CFR Part 640.3 | Autologous<br>AABB Standard 5.4.4; Title 21, CFR Part 640.3 |
|---|---|---|
| Age | Conform to applicable state law or ≥16 years | Alternate requirements defined by blood center's medical director (AABB Standard 5.4.4). |
| Blood pressure | No requirement in AABB standards, systolic and diastolic blood pressure "within normal limits" [Title 21, CFR Part 3(2)]. | |
| Pulse | No requirement in AABB standards or CFR. | |
| Whole blood volume collected | Maximum of 10.5 mL/kg of donor weight, including samples. | |
| Donation interval | 8 weeks after whole blood donation; 16 weeks after 2-unit red cell collection; 4 weeks after infrequent plasmapheresis; and ≥2 days after plasma-, platelet-, or leukapheresis. | |
| Temperature | ≤37.5 C (99.5 F) if measured orally or equivalent if measured by another method. | Deferral for conditions presenting risk of bacteremia (AABB Standard 5.4.4.4). |
| Hemoglobin (hematocrit) | ≥12.5 g/dL (≥38%). | ≥11 g/dL (≥33%). |

CFR = Code of Federal Regulations.

**Table 30.1** Measures used to protect the donor and for donor selection.

| |
|---|
| *Donor selection* |
| Age 17–70 years (maximum 65 at first donation) |
| Weight above 50 kg (7 st 12 lb) |
| Haemoglobin >134 g/L for men, >120 g/L for women |
| Minimum donation interval of 12 weeks (16 weeks advised) and three donations per year maximum |
| Apheresis for platelets or plasma up to 24 times in 12 months |
| Pregnant and lactating women excluded because of high iron requirements; donation deferred for 9 months post pregnancy |
| *Exclusion of those with:*<br>Known cardiovascular disease, including hypertension<br>Significant respiratory disorders<br>Epilepsy and other CNS disorders<br>Gastrointestinal disorders with impaired absorption<br>Previous blood transfusions in the UK<br>Intravenous drug users<br>Insulin-dependent diabetes<br>Chronic renal disease<br>Cancer<br>Ongoing medical investigation or clinical trials |
| *Exclusion of those with:*<br>Known cardiovascular disease, including hypertension<br>Significant respiratory disorders<br>Epilepsy and other CNS disorders<br>Gastrointestinal disorders with impaired absorption<br>Previous blood transfusions in the UK<br>Intravenous drug users<br>Insulin-dependent diabetes<br>Chronic renal disease<br>Cancer<br>Ongoing medical investigation or clinical trials |
| Exclusion of any donor returning to occupations such as driving bus, plane or train, heavy machine or crane operator, mining, scaffolding, etc. because delayed faint would be dangerous |
| Defer for 12 months after body piercing or tattoo, paid sex or homosexual sex, after acupuncture |
| Defer for 2 months after live vaccinations such as measles, mumps |
| Defer if travel history suggests risk of infection |

Drugs



Blood bank
KING SAUD UNIVERSITY HOSPITALS
بنك الدم - المستشفيات الجامعية - جامعة الملك سعود

Confidential

DONOR HEALTH HISTORY QUESTIONNAIRE
REGESTRATION

| Donor No.: | Date: | Unit No. : |
|---|---|---|

Donor Name أسم المتبرع

| الأسم الاول: | الأب: | الجد: | العائلة: |
|---|---|---|---|
| Family Name: | Middle Name: | Father Name: | First Name: |

Date of last donation: Place of last donation:

Result of last donation:

Gender: Male ☐ Female ☐ Nationality:

Date of birth: / / Age:.....years

Passport ☐ Iqama ☐ ID ☐ No.:

Address:

Mobile: Phone:

E- Mail :

Donation Reson سبب التبرع

Volunteer ☐ متطوع Therapeutic ☐ علاجي Repalement ☐ موجه لمريض

Autologous ☐ ذاتي Driving License ☐ استخراج رخصة

Patient File No.: رقم ملف المريض:

Type of donation نوع التبرع

Whole blood ☐ وحدة كاملة Plasma Aphaeresis ☐ بلازما

Automated Double R. B. C. ☐ وحدة مزدوجة من خلايا الدم الحمراء Platelets Aphaeresis ☐ صفائح

THIS SECTION TO BE COMPLETED BY FRIST- TIME DONORS ONLY

HAVE YOU EVER RECEIVED BLOOD ? ☐ YES ☐ NO ☐ UNKNON

CURRENT OCCUPATION :

HOW WOULD YOU PREFEER TO BE REMINDED TO DONATE BLOOD ? ☐ Letter ☐ Mobile ☐ Email ☐ Fax ☐ Phone ☐ SMS ☐ None

| Receptionist: | Signature: |
|---|---|

- **Powerful tool for screening**
- **Identify high risk behaviors.**
- **Some issues can only be ruled out by systemic questionnaire.**

# Infectious Testing

**Table 30.2** Donor testing in England and Wales.

| | |
|---|---|
| 1 | Blood group, Rh status (D,C,E,c,e), K |
| 2 | Screen for red cell alloantibodies |
| 3 | *Microbiological tests* |
| | Human immunodeficiency virus (HIV) 1 and 2; antibody and RNA |
| | Hepatitis B virus (HBV) – antibody and RNA |
| | Hepatitis C virus (HCV) – antibody and RNA |
| | Human T-cell leukaemia viruses (HTLV) – antibody |
| | Cytomegalovirus (CMV) – antibody, for immunosuppressed recipients |
| | Malaria – antibody screening of potentially exposed donors |
| | Chagas' disease – antibody screening of potentially exposed donors |
| | Bacteria – all donations tested for antibody to syphilis |

N.B. At the current time there is no reliable test for detecting prions in blood products.

- Extra testing (not in all cases);
- Sickle cell.
- G6PD level.

# Component Separation

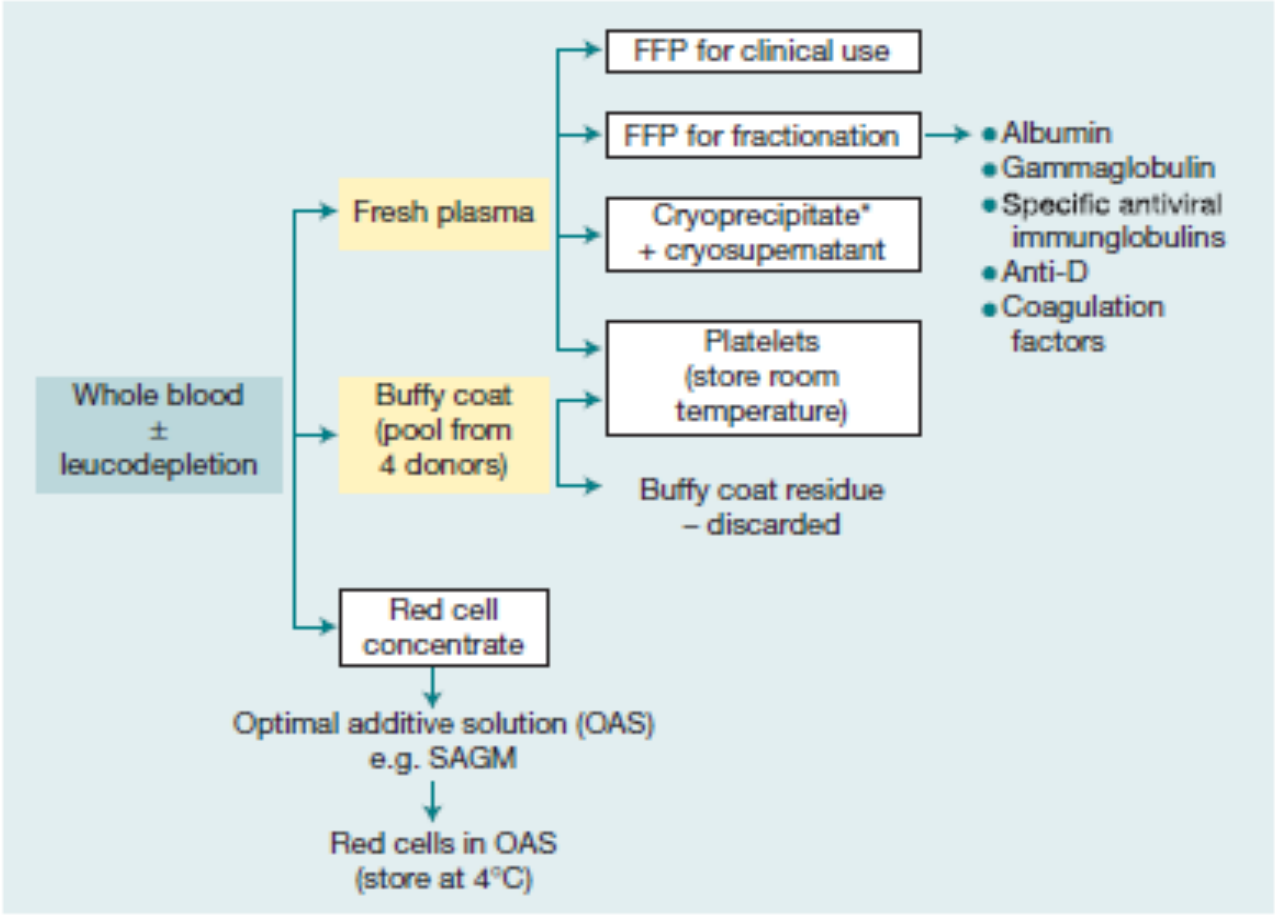



**Figure 30.1** The preparation of blood components from whole blood. FFP, fresh frozen plasma; SAGM, saline-adenine-glucose-mannitol. * Cryoprecipitate is mainly a source of fibrinogen. Cryosupernatant is used for plasma exchange in thrombotic thrombocytopenic purpura. Leucodepletion – see text.

# Component

| Table 1: Storage Details for Various Blood Products | | | |
|---|---|---|---|
| **Product** | **Storage** | **Product** | **Storage** |
| **RBCs / Whole blood** | 35 days (CPDA-1)<br>42 days (Additives)<br>1-6 C | **Granu-locytes** | 24 hours; 20-24 C (no agitation) |
| **Frozen RBCs** | 10 years; –65 C;<br>24 hours after thaw | **Fresh Frozen Plasma** | 1 year; –18 C OR<br>7 years, –65 C;<br>24 hours at 1-6 C after thaw |
| **Washed RBCs** | 24 hours; 1-6 C | | |
| **Platelets** | 5 days; 20-24 C (gentle agitation);<br>4 hours if pooled | **CRYO** | 1 year at –18 C<br>6 hours at 20-24 C after thaw (4 hours if pooled) |

## Whole blood

1. The original blood product!
2. Minimal availability in most blood banks today
3. Specifics:

**Volume:** 450-500 mL
**Contents:**
- RBCs (200-250 mL)
- Plasma (250-300 mL)
- WBCs ($10^9$)
- Platelets
- Anticoagulant (63 or 70 mL)

## Whole blood donor (5-6 pooled)

**Volume:** 40-60 mL
**Contents:**
- PLTs ($\geq 5.5 \times 10^{10}$ in 90%)
- Plasma (40-60 mL)
- WBCs ($10^7$)
- pH $\geq$ 6.2 (90%)

## Fresh Frozen Plasma (FFP)

**Volume:** 200-250 mL
**Contents:**
- All coag factors
- 400 mg fibrinogen
- 1 IU/mL of all others
- Almost no viable WBCs
- NOTE: No QC testing

## Packed RBC unit

Specifics:

**Volume:** 350 mL (incl. additive)
**Contents:**
- RBCs (200-250 mL)
- Plasma ($\leq$ 50 mL)
- WBCs ($10^9$) and PLTs
- Anticoagulant (63 or 70 mL)
- Additive solution
- 200-250 mg iron

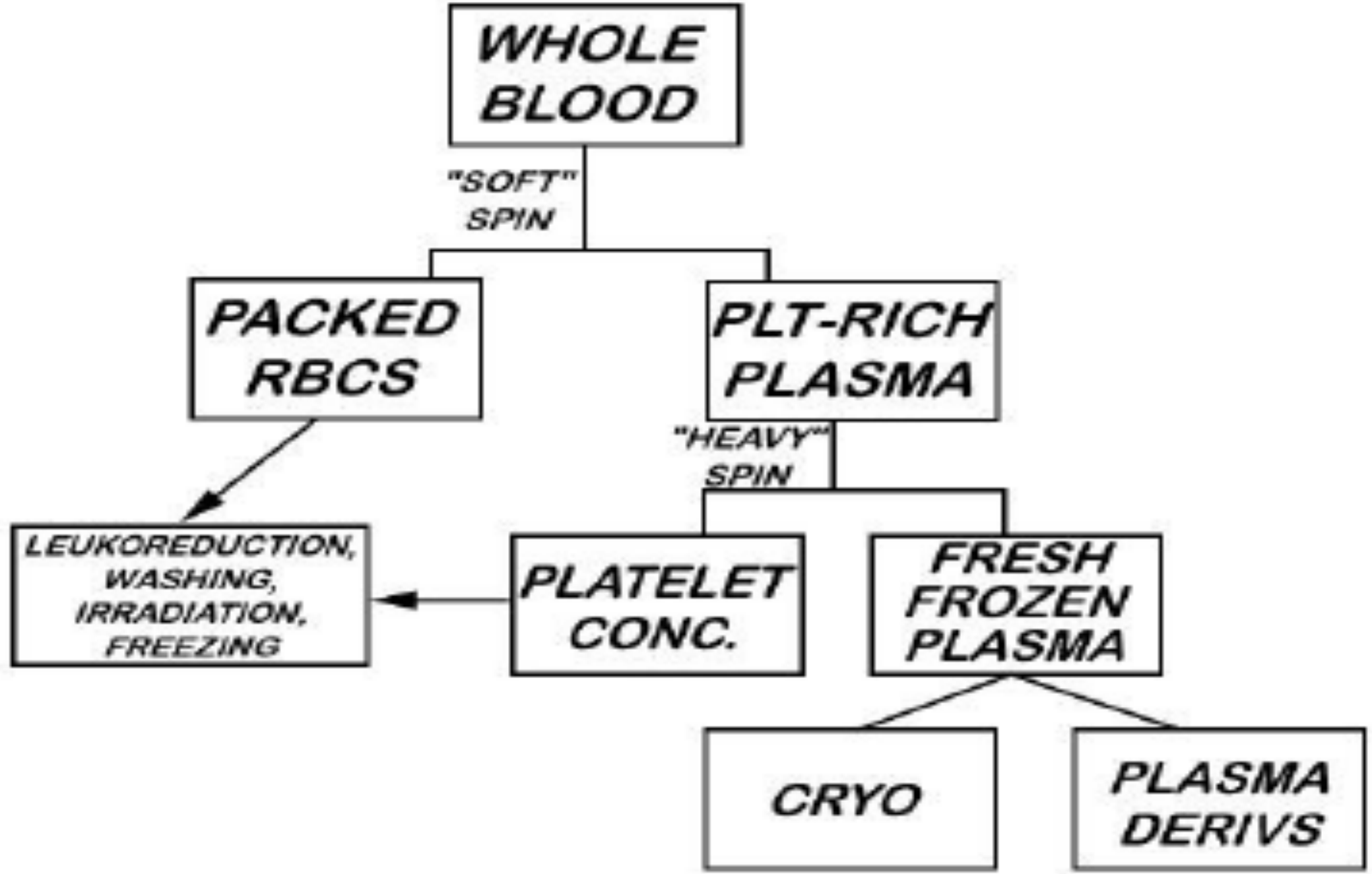
**Without leukoreduction**

## Single donor (apheresis) adult dose

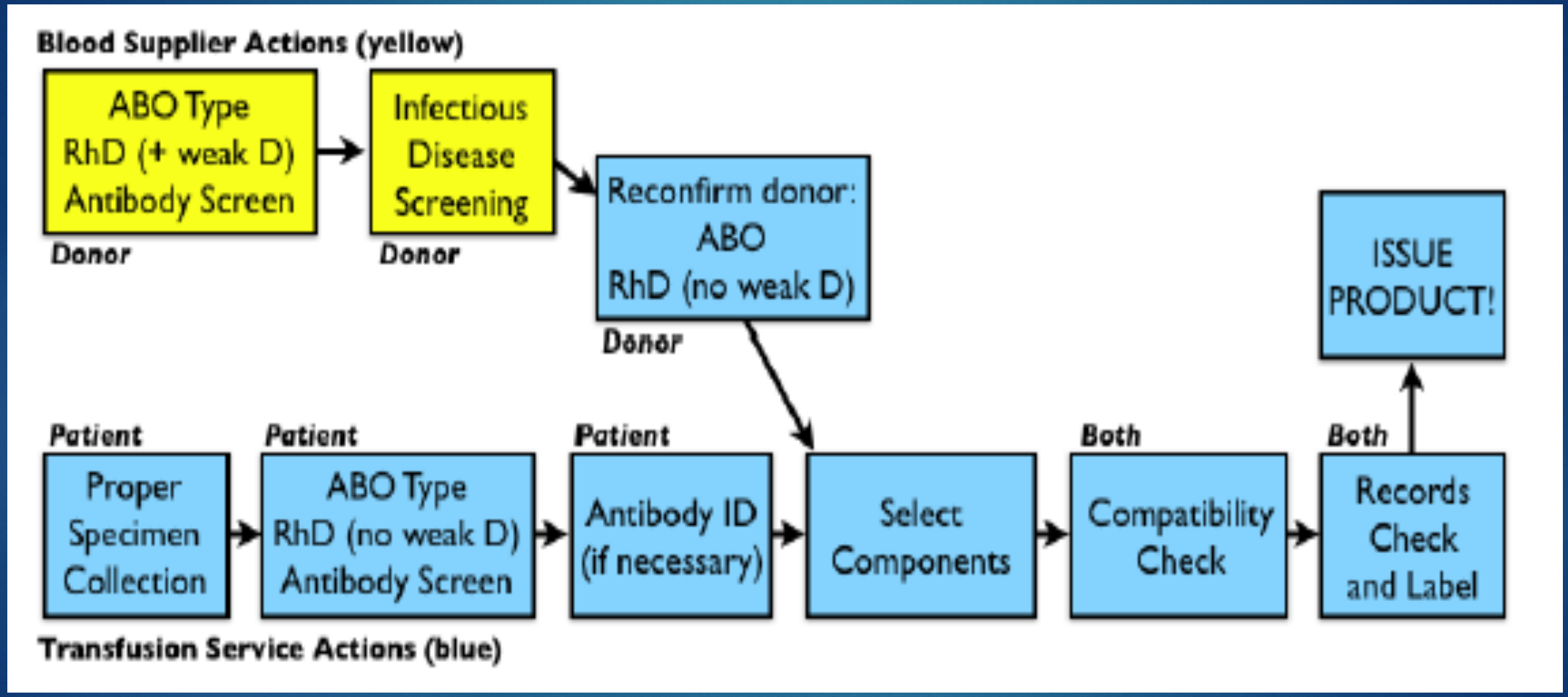
**Volume:** 100-150 mL (or more)
**Contents:**
- PLTs ($\geq 3.0 \times 10^{11}$ in 90%)
- Plasma (100-150 mL)
- WBCs ($< 5.0 \times 10^6$)
- pH $\geq$ 6.2 (90%)

## Cryoprecipitate

**Volume:** 15 mL
**Contents:**
- $\geq$ 150 mg fibrinogen
- $\geq$ 80 IU Factor VIII
- 80-120 IU vWF
- 40-60 IU Factor XIII
- Fibronectin

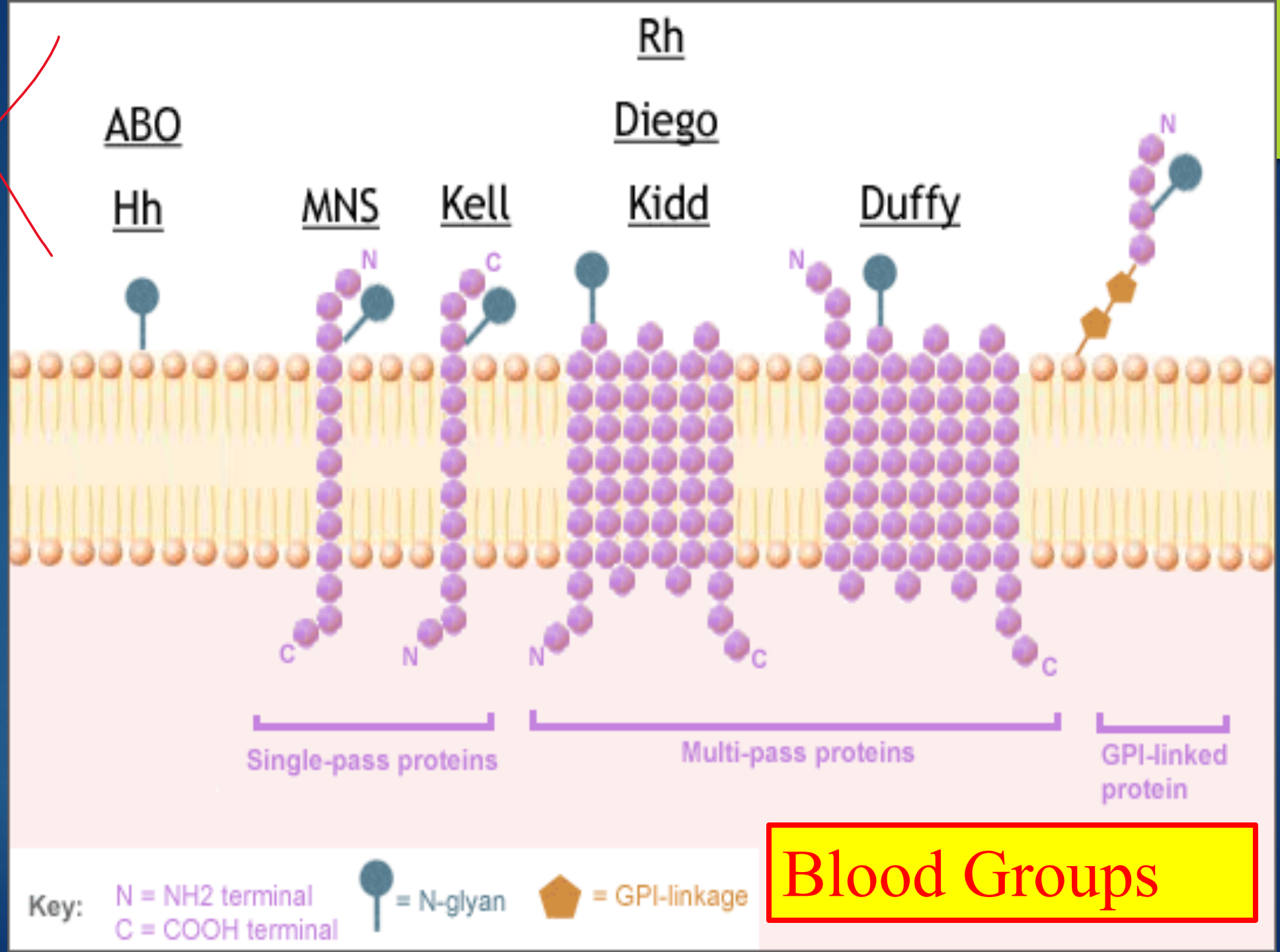

WHOLE BLOOD
"SOFT" SPIN
PACKED RBCS
PLT-RICH PLASMA
"HEAVY" SPIN
LEUKOREDUCTION, WASHING, IRRADIATION, FREEZING
PLATELET CONC.
FRESH FROZEN PLASMA
CRYO
PLASMA DERIVS

# Transfusion Unit



# Blood Groups

- One of the main problems in the transfusion of blood is the avoidance of **immunological reactions** resulting from the differences between donor and recipient red cells.
- When the red cells of a donor are transfused into a recipient who lacks these **antigens**, they may induce an immunological response.
- There are at least 30 major blood group systems (e.g. the ABO group, Rh group).




# Blood Groups

**Table 30.3** Clinically important blood group systems.

| Systems | Frequency of antibodies | Cause of haemolytic transfusion reaction | Cause of haemolytic disease of newborn |
|---|---|---|---|
| ABO | Almost universal | Yes (common) | Yes (usually mild) |
| Rh | Common | Yes (common) | Yes |
| Kell | Occasional | Yes (occasional) | Anaemia not haemolysis |
| Duffy | Occasional | Yes (occasional) | Yes (occasional) |
| Kidd | Occasional | Yes (occasional) | Yes (occasional) |
| Lutheran | Rare | Yes (rare) | No |
| Lewis | Occasional | Yes (rare) | No |
| P | Occasional | Yes (rare) | Yes (rare) |
| MN | Rare | Yes (rare) | Yes (rare) |
| Li | Rare | Unlikely | No |

# ABO system

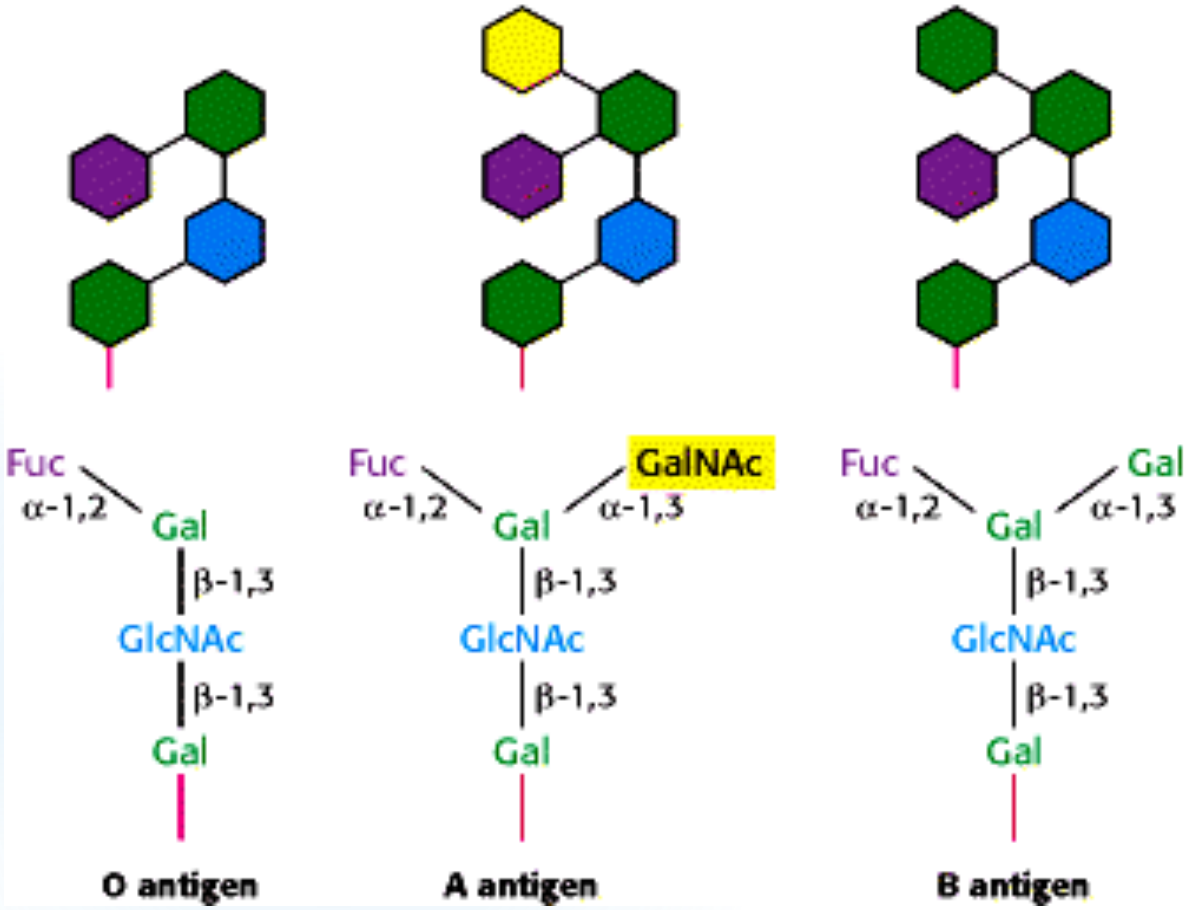
- Practically all red cells have the **H antigen**, a carbohydrate group attached mainly to proteins on the cell membrane (FUT1, Ch19q).
- This H antigen is the basis for the ABO blood groups.
- The ABO locus is encoded on chromosome 9q, where one of three possible alleles may be found.
- The **A allele** encodes for a glycosyltransferase, which modifies the H antigen by adding ***N*-acetylgalactosamine** to it (thus forming the A antigen).

## *cont'd…*

- The **B allele** of the ABO locus encodes an alternative glycosyltransferase that links **galactose** to the H antigen (thus converting it to the B antigen).

- The **O allele**, by contrast, encodes **no functional enzyme** at all, such that the H antigen remains unmodified.

- Hemolytic reactions will occur **immediately** in the event of incompatible transfusion, and may be fatal.



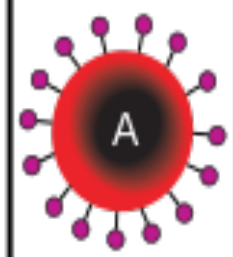
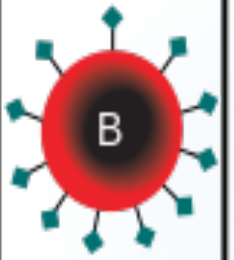
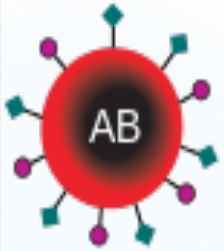
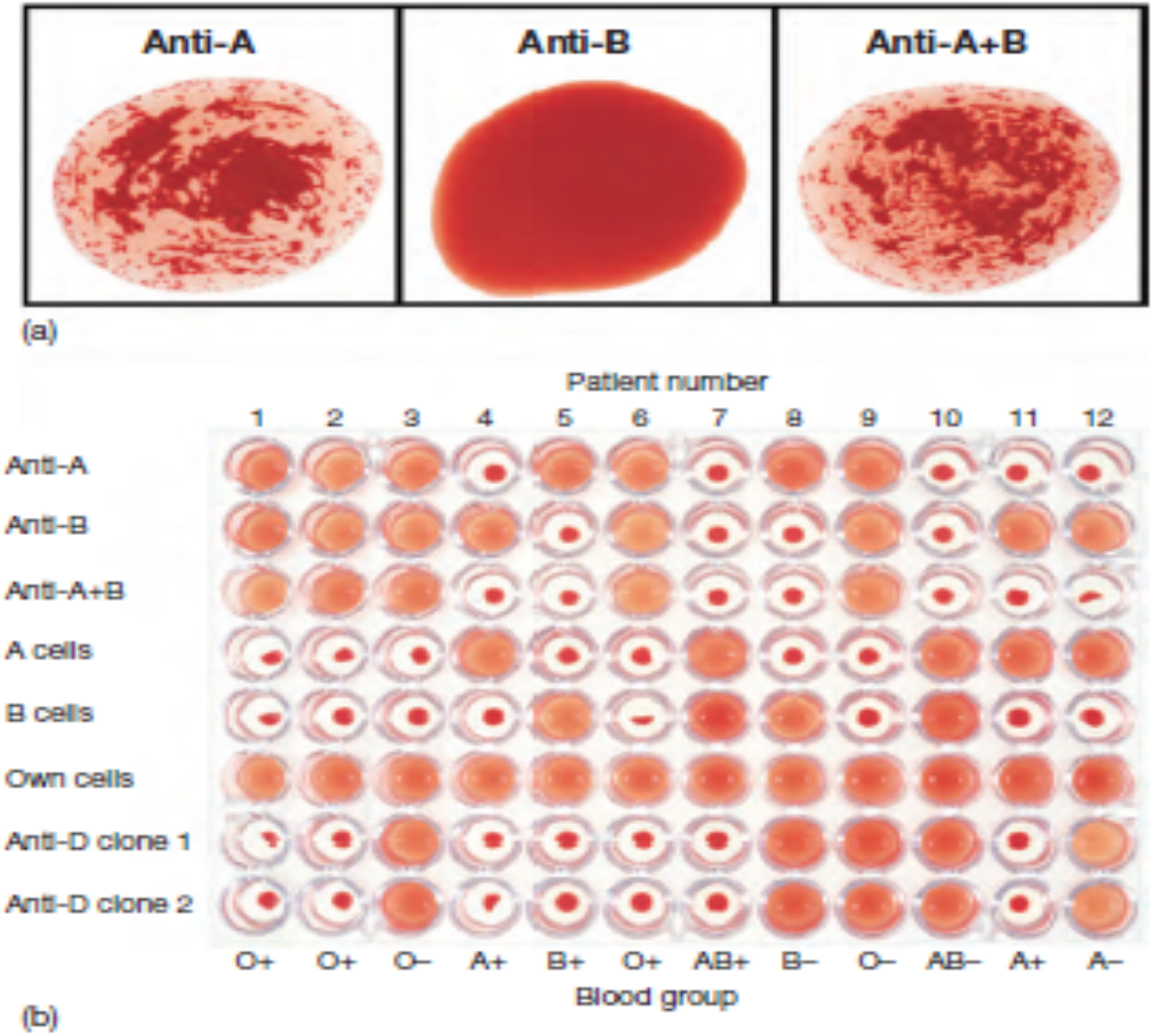

| | Group A | Group B | Group AB | Group O |
|---|---|---|---|---|
| Red blood cell type |   |   |   |   |
| Antibodies in Plasma |  Anti-B |  Anti-A | None |  Anti-A and Anti-B |
| Antigens in Red Blood Cell |  A antigen |  B antigen |  A and B antigens | None |

**Table 30.4** The ABO blood group system.

| Phenotype | Genotype | Antigens | Naturally occurring antibodies | Frequency (UK) (%) |
|---|---|---|---|---|
| O | OO | O | Anti-A, anti-B | 46 |
| A | AA or AO | A | Anti-B | 42 |
| B | BB or BO | B | Anti-A | 9 |
| AB | AB | AB | None | 3 |

| Type | Whites | Blacks | Asians | Native Americans |
|---|---|---|---|---|
| **O** | 45% | 49% | 40% | 79% |
| **A** | 40% | 27% | 28% | 16% |
| **B** | 11% | 20% | 27% | 4% |
| **AB** | 4% | 4% | 5% | <1% |




**Forward grouping**

**Backward grouping**

**RhD grouping**

**Figure 30.3** **(a)** The ABO grouping in a group A patient. The red cells suspended in saline agglutinate in the presence of anti-A or anti-A + B (serum from a group O patient). **(b)** Routine grouping in a 96-well microplate. Positive reactions show as sharp agglutinates; in negative reactions the cells are dispersed. Rows 1–3, patient cells against antisera; rows 4–6, patient sera against known cells; rows 7–8, anti-D against patient cells.

# Rh system

- The Rh system is also of great importance and can cause problems with both transfusion and pregnancy. The inheritance of the Rh blood group system is slightly more complex than that of the ABO system.
- Two separate genetic loci on chromosome 1 encode for a total of five antigens.
- The first locus, *RHD*, has alleles D or d; D encodes a transmembrane protein featuring the D antigen, while the allele d encodes a variant that does not bear this antigen.
- *RHCE* is an adjacent locus that encodes a transmembrane ion channel bearing the antigens C (or its variant, c) and E (or its variant, e). Alleles at this locus may be described as CE, Ce, cE and ce, denoting the set of antigens they encode.
- A complete description of the Rh haplotype for a patient will include alleles at both *RHD* and RHCE loci. The commonest haplotypes are DCe, dce and DcE.

## *cont'd…*

- The D antigen is the most clinically important of the Rh group antigens, due to its high immunogenicity.
- An RhD-negative person (e.g. dce/dce) has over a 50% chance of developing anti-D antibodies after the transfusion of one unit of RhD-positive blood: it is therefore important that RhD-negative patients receive RhD-negative blood.

- Note that unlike the ABO system, Rh antibodies are not naturally occurring; they must be raised by exposure of an antigen-negative individual to the appropriate antigen, either through transfusion of incompatible blood or through pregnancy.
- After the exposure, IgG antibodies come to predominate, and hemolysis is generally extravascular (**major cause of HDFN/HDN**).


**Figure 30.4** Molecular genetics of the Rh blood group. The locus consists of two closely linked genes, *RhD* and *RhCcEe*. The *RhD* gene codes for a single protein which contains the RhD antigen whereas *RhCcEe* mRNA undergoes alternative splicing to three transcripts. One of these encodes the E or e antigen whereas the other two (only one is shown) contain the C or c epitope. A polymorphism at position 226 of the *RhCcEe* gene determines the Ee antigen status whereas the C or c antigens are determined by a four amino acid allelic difference. Some individuals do not have an *RhD* gene and are therefore RhD–.

**Table 30.5** The most common Rh genotypes in the UK population.

| CDE nomenclature | Short symbol | Frequency in white people (%) | Rh D status |
|---|---|---|---|
| cde/cde | rr | 15 | Negative |
| CDe/cde | $R_1r$ | 31 | Positive |
| CDe/CDe | $R_1R_1$ | 16 | Positive |
| cDE/cde | $R_2r$ | 13 | Positive |
| CDe/cDE | $R_1R_2$ | 13 | Positive |
| cDE/cDE | $R_2R_2$ | 3 | Positive |
| Other genotypes | | 9 | Positive (almost all) |

# Management of mother and child

- Women who are negative for RhD are given routine antenatal anti-D prophylaxis at 28 weeks, 34 weeks and within 72 hours of delivery.
- This involves an intramuscular injection of anti-D immunoglobulin, which prevents active immunization in the case of red cell transfer across the placenta.
- Any potentially sensitizing event is also treated with additional anti-D administration: such events include abdominal trauma, threatened abortion, or any spontaneous abortion after 12 weeks.

# Other blood group systems

- Other blood group antibodies, which are sometimes a problem during blood transfusion, include the following:
  - anti-K (Kell system),
  - anti-$Fy^a$ (Duffy system),
  - anti-$Jk^a$ (Kidd system) and
  - anti-S (part of the MNSs blood group system).
- These antigens are relatively poorly immunogenic.
- Their potency in stimulating antibody production is 10-1000 times less than that of RhD.
- Consequently, these antigens may not need be routinely assessed prior to transfusion.

# Compatibility

- The purpose of **cross-matching** blood before transfusion is to ensure that there is no antibody present in the recipient's plasma that will react with any antigen on the donor's cells (major cross-match, IAT).

- The basic technique for detecting such antibodies relies on their ability to agglutinate red cells that bear the appropriate antigen.

# Antiglobulin test

- Its purpose is to detect antibodies to red cell surface, either bound to the red cell surface or free in the serum.

- The antiglobulin test can be used in two ways:

  - First, the ***direct antiglobulin test***, used in the diagnosis of autoimmune hemolytic anemia. it can be used to detect antibody already on the patient's cells *in vivo*. Red cells are washed to remove the free IgG in the plasma, which would otherwise react with and neutralize the antiglobulin. After washing, anti-human globin is added and, if the red cells are coated with antibody, agglutination takes place.

## *cont'd…*

- Second, *the* ***indirect antiglobulin test***, the test can be used to detect the presence of antibody in serum, as in the cross-matching of blood for transfusion. In this case, serum from the patient who requires transfusion is incubated with donor red cells. Any antibody present in the recipient's serum that has specificity for antigens on the donor's cells will interact with those cells. After washing, addition of anti-human globulin will bring about red cell agglutination.

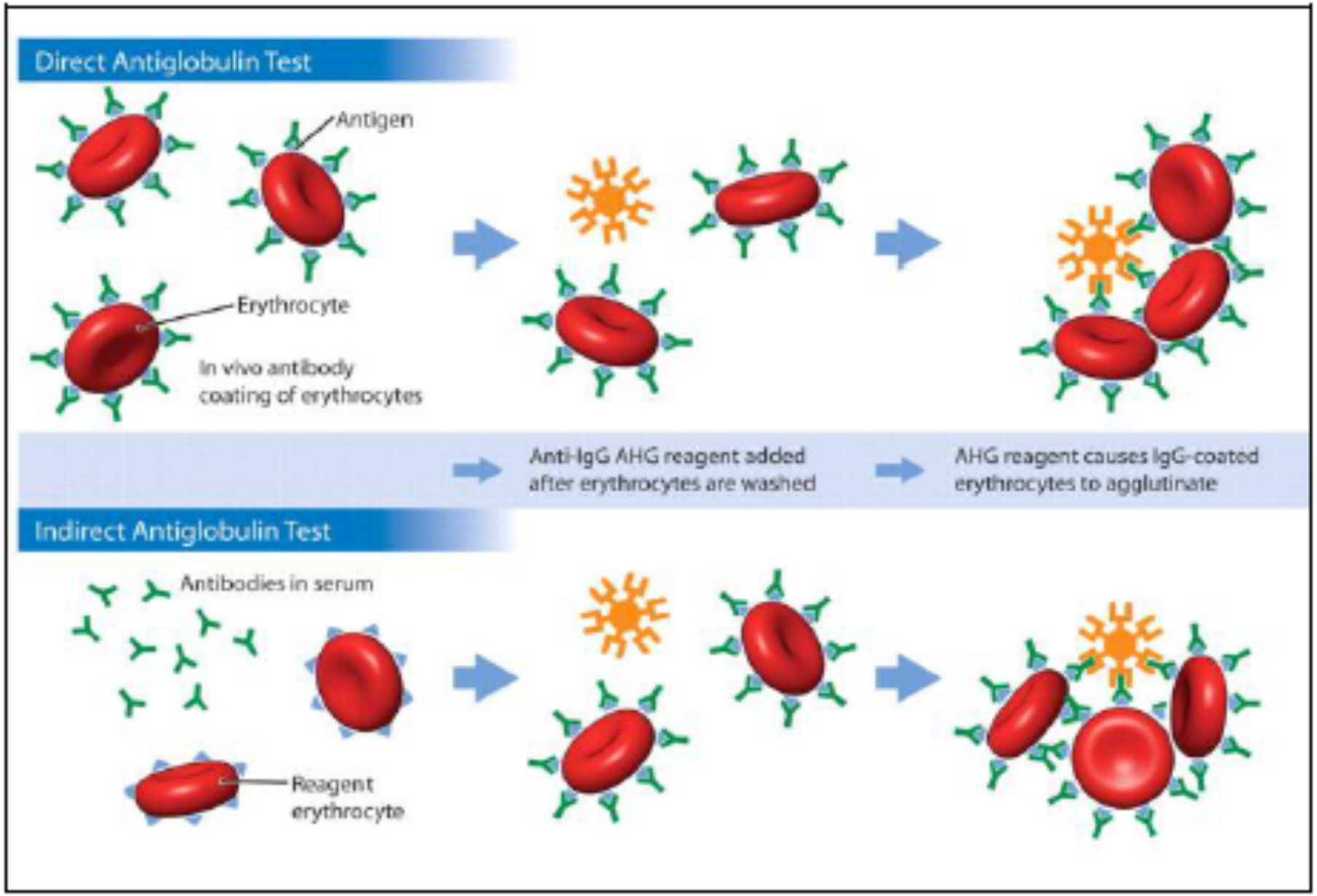



Image credit: Zarandona JM and Yazer MH. The role of the Coombs test in the evaluation of hemolysis in adults. Canadian Medical Association Journal 2006;174:305-307

# Hazards of blood transfusion:

the Serious Hazards of Transfusion (SHOT) Committee, between 1996 and 2010.

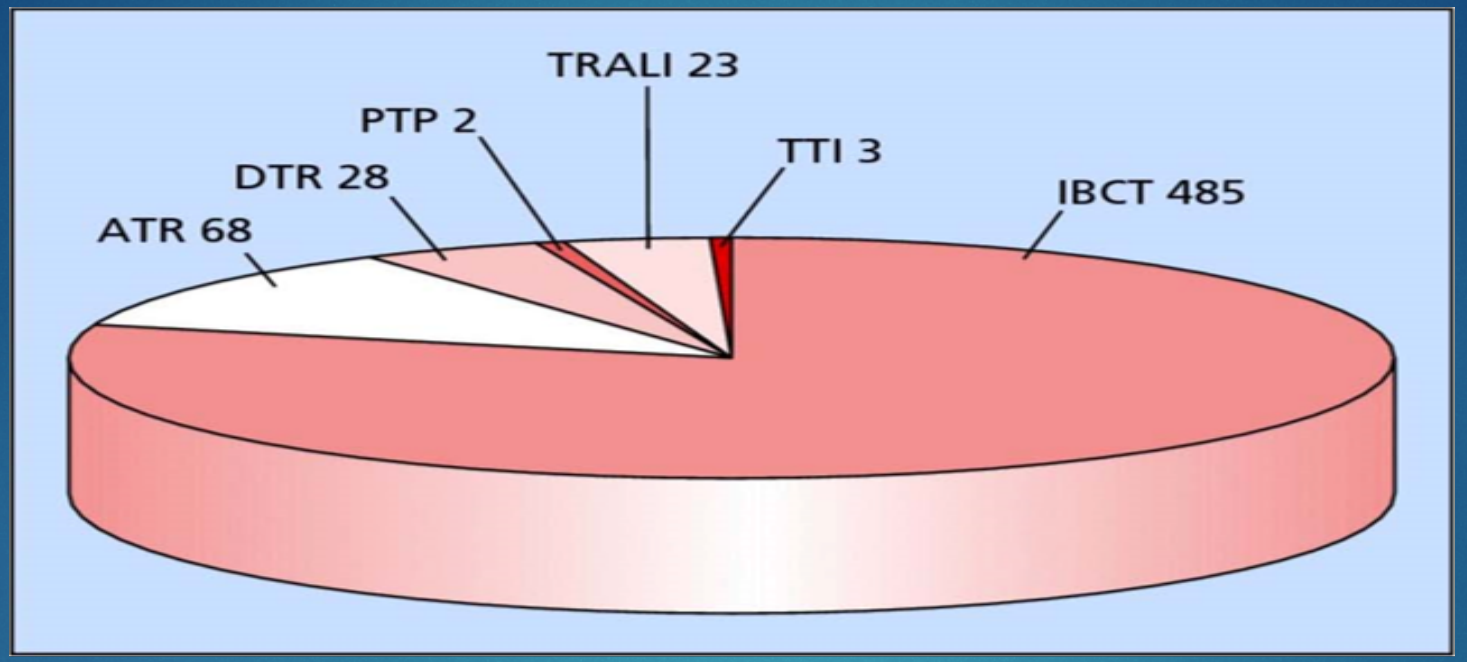



**Figure 15.1** Pie chart showing hazards of transfusion in the UK from 1996-2010 as reported to the SHOT Committee. *Notes:* TRALI - transfusion-associated acute lung injury; TTI - transfusion-transmitted infection; ATR - acute transfusion reaction; DTR - delayed transfusion reaction; PTP - post-transfusion purpura; IBCT - incorrect blood component transfused

Source: UK SHOT Committee report 2010.

| Table 30.6 Measures to protect recipient. |
| --- |
| Donor selection (see Table 30.1) |
| Donor deferral/exclusion (see Table 30.1) |
| Stringent arm cleaning |
| Microbiological testing of donations (Table 30.2) |
| Immunohaematological testing of donations |
| Discarding the first 20–30 mL of blood collected |
| Leucodepletion of cellular products |
| Post-collection viral inactivation of FFP |
| Monitoring and testing for bacterial contamination |
| Pathogen inactivation of cellular components |
| Safest possible sources of donor for plasma products |

FFP, fresh frozen plasma.

**Early**

| |
|---|
| Citrate toxicity |
| Hyperkalaemia |
| Hypocalcaemia(infants, massive transfusion) |
| Clotting abnormalities (after massive transfusion) |
| Transfusion-related acute lung injury (TRALI) |
| Post-transfusion purpura |
| Anaphylaxis (in IgA deficient subjects) |

**Table 30.9** Complications of blood transfusion.

| Early | Late |
|---|---|
| Haemolytic reactions: immediate (IgM) or delayed (IgG) | Transmission of infection (see Table 30.7) |
| Reactions caused by infected blood | Transfusional iron overload (see Chapter 4) |
| Allergic reactions to white cells, platelets or proteins | Immune sensitization, e.g. to red cells, platelets or Rh D antigen |
| Pyrogenic reactions (to plasma proteins or caused by HLA antibodies) | Transfusion-associated graft-versus-host disease |
| Circulatory overload | |
| Bacterial contamination | |
| Air embolism | |
| Thrombophlebitis | |

**Solution: irradiation**

# Management of Transfusion Reactions

- The **first action is always to stop the transfusion** and clarify that the correct patient's details are on the component being transfused.
- Any suspicion of ABO incompatibility should lead to the institution of circulatory support with IV fluids, careful monitoring of pulse, blood pressure and urine output, and supportive management of any developing DIC.

- The component bag should be returned to the transfusion laboratory with a fresh cross-match sample from the patient.
- Samples should also be sent to assess for intravascular hemolysis - including a full blood count, serum haptoglobin, and hemoglobinuria.
- It is important to ensure that the possibility of bacterially contaminated units has been addressed through taking blood cultures.

## *cont'd…*

- If necessary, broad-spectrum antibiotics may be commenced empirically after cultures have been drawn.
- Severe allergic reaction should be treated initially by stopping the transfusion and returning the unit to the laboratory.

- Chlorpheniramine may help, but severe reactions are likely to require oxygen and nebulized salbutamol, plus intramuscular adrenaline in the case of circulatory collapse.
- With mild fevers only, simple interventions may suffice (e.g. giving an antipyretic and slowing the transfusion); similarly, if a mild allergic reaction is evident (e.g. urticaria), chlorpheniramine followed by a slower reinstatement of the transfusion may help.

- Appropriate investigations include a full blood count, a direct antiglobulin test, serum bilirubin and assessment of renal function.

# Massive transfusion

- Patients with acute hemorrhage (i.e. loss of red cells and plasma) may need to be transfused with large quantities of packed red cells.
- Massive transfusion has been defined as the replacement of one blood volume over 24 hours, or as the replacement of 50% of circulating volume in 3 hours.

- With the transfusion of many units of packed red cells, the patient may become deficient in key plasma components such as clotting factors and may also become thrombocytopenic (even in the absence of DIC).

- The administration of one unit of FFP per unit of red cells may be effective in replacing clotting factors. Fibrinogen and platelets should also be replaced, with 2 pools of cryoprecipitate and 1 adult dose of platelets per 6-8 units of packed red cells.

# Always Quality First;

## Contents

# Conclusion:

- The main goal of blood bank services is to provide a safe blood component in timely and cost-effectiveness manners.
- Different key dedicated areas in the blood bank serve in harmony to achieve the main goal.
- Always, there is a risk in transfusion. All implemented standards goal to minimize the risk.
- **Always, maintain the quality!**

***Thank You!!!***

# Example MCQs

- **Which one of the following services is not under the donation sector of the blood bank?**
  - A) Collection of whole blood unit.
  - B) Reconfirmation of donor blood group.
  - C) Component separation.
  - D) ) Infectious agents testing.
  - E) All services are belong the donation sector.

# HEALTH Check QUESTIONNAIRE

Please respond by placing a ✓ in the relevant box. Do not circle.

| | |
|---|---|
| 1. Are you feeling well and healthy today ? | ☐ YES ☐ NO |
| 2. Did you eat well in the last 3hours? | ☐ YES ☐ NO |
| 3. Did you sleep well? ☐ YES ☐ NO .How many hours did you sleep for the last 24 hours?..... | |
| 4. Are you Currently taking an antibiotic? | ☐ YES ☐ NO |
| 5. Are you Currently taking any other medication ? ☐ YES ☐ NO What ?..... | |
| 6.Have you read the educational materials? | ☐ YES ☐ NO |
| 7. Since last week have you had any dental surgery ? | ☐ YES ☐ NO |
| 8. Have you ever been rejected as a blood donor ? ☐ YES ☐ NO If yes why ?..... | |
| 9. In the past 72 hours Have you taken aspirin or anything that has aspirin in it? | ☐ YES ☐ NO |
| # In the past 8 weeks have you: | |
| 10. Donated blood? | ☐ YES ☐ NO |
| 11. Had contact with someone who had a smallpox vaccination? | ☐ YES ☐ NO |
| # In the past 16 weeks: | |
| 12. Have you donated a double unit of red cells using an apheresis machine? | ☐ YES ☐ NO |
| 13. Had any vaccinations or other shots? | ☐ YES ☐ NO |
| # In the past 12 months have you: | |
| 14. have you had surgery or sever illness ? | ☐ YES ☐ NO |
| 15. have you or your spouse received blood or blood components? | ☐ YES ☐ NO |
| 16. Had a transplant such as organ, tissue, or bone marrow? | ☐ YES ☐ NO |
| 17. Had an accidental needle-stick? | ☐ YES ☐ NO |
| 18. Had sexual contact with anyone who has HIV/AIDS or has had a positive test for the HIV/AIDS virus or hemophilia or has used clotting factor concentrates? | ☐ YES ☐ NO |
| 19. Had sexual contact with a person who has hepatitis? | ☐ YES ☐ NO |
| 20. Ever been I.V. drug user, or used intranasal cocaine'? | ☐ YES ☐ NO |
| 21. Lived with a person who has hepatitis, HIV/AIDS or has had a positive test for the HIV/AIDS ? | ☐ YES ☐ NO |
| 22. Had a tattoo, acupuncture, hejama , ear or body piercing? | ☐ YES ☐ NO |
| 23. Had or been treated for syphilis or gonorrhea? | ☐ YES ☐ NO |
| 24. Been in juvenile detention or prison for more than 72 hours? | ☐ YES ☐ NO |
| 25. Been outside the Kingdom of Sauidi Arabia ? | ☐ YES ☐ NO |
| 26. been given rabies shots ? | ☐ YES ☐ NO |
| 27. had any medical investigations or tests (including endoscopy)? | ☐ YES ☐ NO |

# From 1980 till now,

| | | |
|---|---|---|
| 28. Did you spend time that adds up to six (6) months or more in the United Kingdom? | ☐ YES | ☐ NO |
| 29. Spend time that adds up to five (5) years or more in Europe? | ☐ YES | ☐ NO |
| 30. Receive a blood transfusion in the United Kingdom or France? | ☐ YES | ☐ NO |

# Have you EVER:

| | | |
|---|---|---|
| 31. Had a positive test for the HIV/AIDS virus? | ☐ YES | ☐ NO |
| 32. Used needles to take drugs, steroids, or anything not prescribed by your doctor? | ☐ YES | ☐ NO |
| 33. Received a dura mater (or brain covering) graft? | ☐ YES | ☐ NO |
| 34. Had a graft such as bone , skin or cornea? | ☐ YES | ☐ NO |
| 35. Come into contact with someone else's blood? | ☐ YES | ☐ NO |
| 36. Had jaundice or hepatitis? | ☐ YES | ☐ NO |
| 37. Had a serious illness or seen a doctor about your heart? | ☐ YES | ☐ NO |
| 38. Had any type of cancer, including leukemia? | ☐ YES | ☐ NO |
| 39. Had growth hormone , Or injected with beef insulin ? | ☐ YES | ☐ NO |
| 40. Any of your relatives had Creutzfeldt-Jakob disease [ Cow – madness disease ]? | ☐ YES | ☐ NO |

42 Do you know that, if you have AIDS virus. you can transmit it even with negative AIDS test?

43 If you suffer or have you suffered from one of these diseases please respond by placing a ✓ in the relevant box:

☐ Severe loss of weight

| | | | |
|---|---|---|---|
| ☐ Syphilis | ☐ Prolonged fever or diarrhea | ☐ Asthma | ☐ Gonorrhea |
| ☐ Enlarged glands | ☐ Allergy | ☐ Malaria | ☐ Hepatitis |
| ☐ Unexplained weight loss | ☐ Skin disease | ☐ Jaundice | ☐ Brucellosis |
| ☐ Heart Disease | ☐ Diabetes | ☐ Leishmaniasis | ☐ Blood disease |
| ☐ Bleeding abnormalities | ☐ Chaga's disease | ☐ AIDS | ☐ Kidney disease |
| ☐ Epilepsy | ☐ Lung disease | ☐ Stroke | ☐ Others:..... |

44. To be answered by women only.

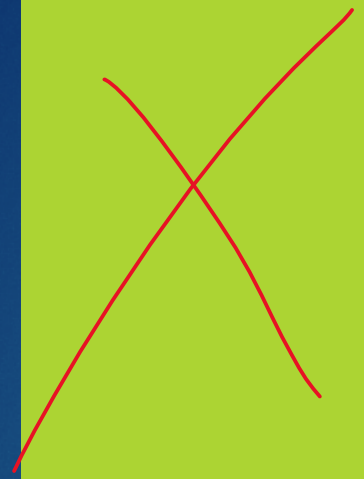
☐ during the past 6 weeks have you been pregnant or ☐ delivered a baby or ☐ are menstruating now?

I have today read, understood and answered accurately all the above questions to the best of my knowledge. I hereby grant permission to the blood bank of University Hospitals to draw one unit of whole blood or to perform apheresis procedure . I agree that my blood donation will be tested for diseases and to be used for the benefit of patients as blood bank wishes.

| Donor Name: | Donor Signature: | Date: / / |
|---|---|---|

Do you wish to speak in confidence to a doctor or a nurse? ☐ YES ☐ NO

*Thank you for coming to give blood today*



# MEDICAL EXAMIANTION by blood bank staff

| | | | |
|---|---|---|---|
| General Condition: | Donor Height cm | Donor Weight Kg | |
| Temp.: °C | Pulse : /min. | *B.P m.m Hg | |
| ☐ Accept | ☐ Defer | ☐ Permenant | ☐ Temporary |
| Cause of rejection | | | |
| Recall Date: | | | |
| Remarks | | | |
| Physician Name: | Signature: | Date: / / | |

## CHECK UP SCREENING

| | | | |
|---|---|---|---|
| Capillary *Hb. level g/dl | ☐ Male | ☐ Female | |
| Blood group if applicable: | | | |
| ☐ Accept | ☐ Reject | | |
| Technician Name: | Signature: | Date: / / | |

## BLOOD COLLECTION

| | | | |
|---|---|---|---|
| ☐ Complete | ☐ Discontinued Product | ☐ Adverse reactions | |
| Type of reaction | | | |
| *V.P. Time start: ☐ AM ☐ PM | - *V.P. Time end: | ☐ AM ☐ PM, | |
| Unit Volume: | | | |
| Blood Bag Lot No.: | Expired Date: | | |
| Technician Name: | Signature: | Date: / / | |

Key: * B.P. = Blood Pressure. * Hb. = Hemoglobin. * V.P. = Venipuncture.

(سري)

Blood bank
KING SAUD UNIVERSITY HOSPITALS
بنك الدم - المستشفيات الجامعية - جامعة الملك سعود

# استمارة التبرع بالدم
## تسجيل المتبرع

| Donor No.: | Date: | Unit No. : |
|---|---|---|

**Donor Name اسم المتبرع**

| First Name: | Father Name: | Middle Name: | Family Name: |
|---|---|---|---|
| العائلة: | الجد: | الأب: | الاسم الأول: |

تاريخ آخر تبرع — مكان التبرع

نتيجة آخر تبرع

الجنس ☐ ذكر ☐ أنثى — الجنسية

تاريخ الميلاد — محل الميلاد — العمر — سنة

☐ جواز ☐ بطاقة أحوال ☐ إقامة — رقم

العنوان

جوال — رقم الهاتف

البريد الالكتروني

**Reson of Donation سبب التبرع**

موجه لمريض ☐ Replacement — علاجي ☐ Therapeutic — متطوع ☐ Volunteer

استخراج رخصة ☐ Driving License — ذاتي ☐ Autologous

رقم ملف المريض: — Patient File No.:

**Type of donation نوع التبرع**

صفائح ☐ Platelets Aphaeresis — وحدة كاملة ☐ Whole blood

بلازما ☐ Plasma Aphaeresis — وحدة مزدوجة من خلايا الدم الحمراء ☐ Automated Double R. B. C.

**تملأ هذه البيانات في أول زيارة للتبرع بالدم فقط**

هل سبق أن نقل لك دم طوال حياتك — نعم ☐ — لا ☐ — لا أعرف ☐

الوظيفة الحالية

ما هي الوسيلة التي تفضلها لتذكيرك للتبرع بالدم ؟ — خطاب ☐ — الجوال ☐ — البريد الإلكتروني ☐

فاكس ☐ — التليفون ☐ — رسالة SMS ☐ — لاشيء ☐

| موظف الاستقبال | التوقيع |
|---|---|

# التاريخ الصحي للمتبرع

ضع علامة ✓ في المربع المناسب لإجابتك

| | |
|---|---|
| ١. هل تشعر بأنك بصحة جيدة اليوم؟ | ☐ نعم ☐ لا |
| ٢. هل تناولت أي مأكولات خلال الثلاث الساعات السابقة؟ | ☐ نعم ☐ لا |
| ٣. هل أخذت قسطاً وافراً من النوم ؟ ☐ نعم ☐ لا كم ساعة نمت خلال ٢٤ ساعة الماضية؟..... | |
| ٤. هل تأخذ حاليا أي مضادات حيوية ؟ | ☐ نعم ☐ لا |
| ٥. هل تأخذ أي علاج الآن؟ ☐ نعم ☐ لا إذا كان نعم فماهو ؟ ..... | |
| ٦. هل قرأت المطويات التعليمية (النشرات) التعليمة؟ | ☐ نعم ☐ لا |
| ٧. هل أجريت لك جراحة بالأسنان خلال الأسبوع الماضي؟ | ☐ نعم ☐ لا |
| ٨. هل سبق رفضك كمتبرع بالدم؟ ☐ نعم ☐ لا لماذا؟ | |
| ٩. خلال الـ ٧٢ ساعة السابقة للتبرع هل أخذت أسبرين أو أي دواء يحتوي على أسبرين؟ | ☐ نعم ☐ لا |
| **# خلال الـ ٨ أسابيع ( شهرين) السابقة للتبرع:** | |
| ١٠. هل تبرعت بالدم؟ | ☐ نعم ☐ لا |
| ١١. هل خالطت شخصاً قد أخذ تطعيم الجدري؟ | ☐ نعم ☐ لا |
| **# خلال الـ ١٦ أسبوعاً ( ٤أشهر تقريبا ) السابقة للتبرع:** | |
| ١٢. هل تبرعت بوحدة دم مزدوجة بأستخدام جهاز فصل الخلايا؟ | ☐ نعم ☐ لا |
| ١٣. هل أخذت أياً من التطعيمات أو أي نوع من الحقن؟ | ☐ نعم ☐ لا |
| **# خلال الـ ١٢ شهراً السابقة للتبرع:** | |
| ١٤. هل أجريت لك عملية جراحية؟ أو عانيت من مرض شديد؟ | ☐ نعم ☐ لا |
| ١٥. هل نقل لك دم أو أي من مشتقاته؟ (زوجك/زوجتك)؟ | ☐ نعم ☐ لا |
| ١٦. هل لامست دم شخص آخر؟ | ☐ نعم ☐ لا |
| ١٧. هل سبق وخزك بإبرة عن طريق الخطأ؟ | ☐ نعم ☐ لا |
| ١٨. هل ( زوجتك/زوجك ) مريض بالهيموفيليا أو(تأخذ/يأخذ) عوامل التجلط؟ | ☐ نعم ☐ لا |
| ١٩. هل كانت هناك أيه علاقة جنسية غير شرعية؟ أومع مريض بالالتهاب الكبدي؟ | ☐ نعم ☐ لا |
| ٢٠. هل كنت تتناول المخدرات عن طريق الحقن أو تستنشق كوكايين؟ | ☐ نعم ☐ لا |
| ٢١. هل خالطت شخصاً مصاباً بالالتهاب الكبدى الفيروسي (باء) أو (سي) ؟ | ☐ نعم ☐ لا |
| ٢٢. هل خالطت شخصاً مصاباً بمرض الإيدز؟ | ☐ نعم ☐ لا |
| ٢٣. هل عملت وشماً أو حجامة أوعولجت بالإبر الصينية أو أجريت ثقباً للأذن أو ثقباً للجلد؟ | ☐ نعم ☐ لا |
| ٢٤. هل عولجت أو تعالج حاليا من السيلان أو الزهري؟ | ☐ نعم ☐ لا |
| ٢٥. هل كنت مسجوناً لأكثر من ٧٢ ساعة؟ | ☐ نعم ☐ لا |
| ٢٦. هل سافرت خارج المملكة العربية السعودية خلال العام الماضي؟ ☐ نعم ☐ لا إذا كانت الاجابة نعم ..أين ؟ ومتى ؟..... | |
| ٢٧. هل أخذت علاجاً بالحقن لمرض الكلب خلال العام الماضي؟ | ☐ نعم ☐ لا |
| ٢٨. هل أجريت أي فحوصات طبية (بما في ذلك المناظير) ؟ | ☐ نعم ☐ لا |

| # المدة من ١٩٨٠م وحتى الآن: | | |
|---|---|---|
| ٢٩. هل أقمت في إنجلترا لمدة٦ أشهر أو أكثر؟ | ☐ نعم | ☐ لا |
| ٣٠. هل أمضيت فترة أكثر من ٥ سنوات في أوروبا؟ | ☐ نعم | ☐ لا |
| ٣١. هل أخذت دماً أو أحد مشتقاته في بريطانيا (المملكة المتحدة) أو فرنسا ؟أو في أي بلد خارج المملكة؟ | ☐ نعم | ☐ لا |
| # هل كان عندك قبل ذلك (طوال حياتك): | | |
| ٣٢. نتيجة إيجابية لمرض نقص المناعة ( الإيدز )؟ | ☐ نعم | ☐ لا |
| ٣٣. هل أجريت لك عملية جراحية بالمخ لزراعة غشاء الديورا؟ | ☐ نعم | ☐ لا |
| ٣٤. هل زرعت لك أعضاء أو أنسجة أو نخاع ؟ | ☐ نعم | ☐ لا |
| ٣٥. هل أجرى لك ترقيع للجلد أو للعظام أو للقرنية؟ | ☐ نعم | ☐ لا |
| ٣٦. هل كان لديك يرقان (صفراء) أو إلتهاب كبدي؟ | ☐ نعم | ☐ لا |
| ٣٧. هل كان لديك مرض شديد أجريت فحصاً لقلبك بواسطة طبيب؟ | ☐ نعم | ☐ لا |
| ٣٨. هل أصبت بأي سرطان بما في ذلك اللوكيميا؟ | ☐ نعم | ☐ لا |
| ٣٩. هل أخذت حقن أنسولين بقري ؟ أو هرمون النمو؟ | ☐ نعم | ☐ لا |
| ٤٠. هل أصبت أو أحد أفراد أسرتك بمرض جنون البقر؟ | ☐ نعم | ☐ لا |

٤١. هل تعلم لو انك تحمل فيروس الإيدز، فانك ستنقله للآخرين عن طريق الدم حتى لو كانت نتيجة فحص الايدز سلبية؟

٤٢. هل تعاني حاليا أو عانيت في الماضي من أحد الأمراض التالية؟

ضع علامة ✓ إذا كان لديك هذا المرض:

☐ نقص شديد في الوزن بدون أسباب ☐ إرتفاع بالحرارة أو إسهال مستمر لفترة طويلة ☐ الإيدز ☐ التهاب كبد فيروسي

☐ مرض السكري ☐ تضخم بالغدد ☐ لشما نيا ☐ أمراض بالدم ☐ أمراض النزف

☐ جلطة الدماغ أو نزيف بالمخ ☐ مرض بالقلب ☐ مرض بالرئتين ☐ الدرن ☐ ربو شعبي

☐ سيلان ☐ الصرع ☐ مرض بالكلى ☐ حساسية ☐ الملا ريا ☐ حمى مالطية

☐ يرقان ☐ مرض شاجاز ☐ مرض جلدي (صدفية، بهاق، حزاز، أكزيما .....الخ) ☐ أي أمراض أخرى

٤٣. للإناث: (أ) خلال الستة الأسابيع الأخيرة :

هل كنت حاملاً؟ ☐ نعم ☐ لا أو وضعتي مولودا ؟ ☐ نعم ☐ لا

أوكان هناك إجهاض؟ ☐ نعم ☐ لا

(ب) هل عندك الدورة الشهرية الآن ؟ ☐ نعم ☐ لا

لقد قرأت وفهمت وأجبت بصدق على جميع الأسئلة السابقة بقدر علمي، كما أنني أفوض بنك الدم بالمستشفيات الجامعية بسحب وحدة دم منى (٤٥٠ مل) أو وحدة صفائح دم أو وحدة بلازما أو وحدة كريات دم حمراء ، وإجراء عملية فصل المكونات المختلفة للدم . وأفوض بنك الدم لكي يستخدمة في منفعة المرضى بالطريقة التي يراها مناسبة.

| اسم المتبرع: | التوقيع : | التاريخ : / / |
|---|---|---|

شكرا لحضورك للتبرع اليوم

## خاص بالعاملين ببنك الدم

| | | |
|---|---|---|
| General Condition: | Donor Height cm | Donor Weight Kg |
| Temp.: °C | Pulse : /min. | *B.P m.m Hg |
| ☐ Accept ☐ Defer | ☐ Permenant | ☐ Temporary |
| Cause of rejection | | |
| Recall Date: | | |
| Remarks | | |
| Physician Name : | Signature: | Date: / / |

### CHECK UP SCREENING

| | | |
|---|---|---|
| Capillary *Hb. level g/dl | ☐ Male | ☐ Female |
| Blood group if applicable: | | |
| ☐ Accept | ☐ Reject | |
| Technician Name: | Signature: | Date: / / |

### BLOOD COLLECTION

| | | |
|---|---|---|
| ☐ Complete | ☐ Discontinued Product | ☐ Adverse reactions |
| Type of reaction | | |
| *V.P. Time start: ☐ AM ☐ PM | - *V.P. Time end: | ☐ AM ☐ PM, |
| Unit Volume: | | |
| Blood Bag Lot No.: | Expired Date: | |
| Technician Name: | Signature: | Date: / / |

Key: * B.P. = Blood Pressure. * Hb. = Hemoglobin. * V.P. = Venipuncture.

مطابع جامعة الملك سعود