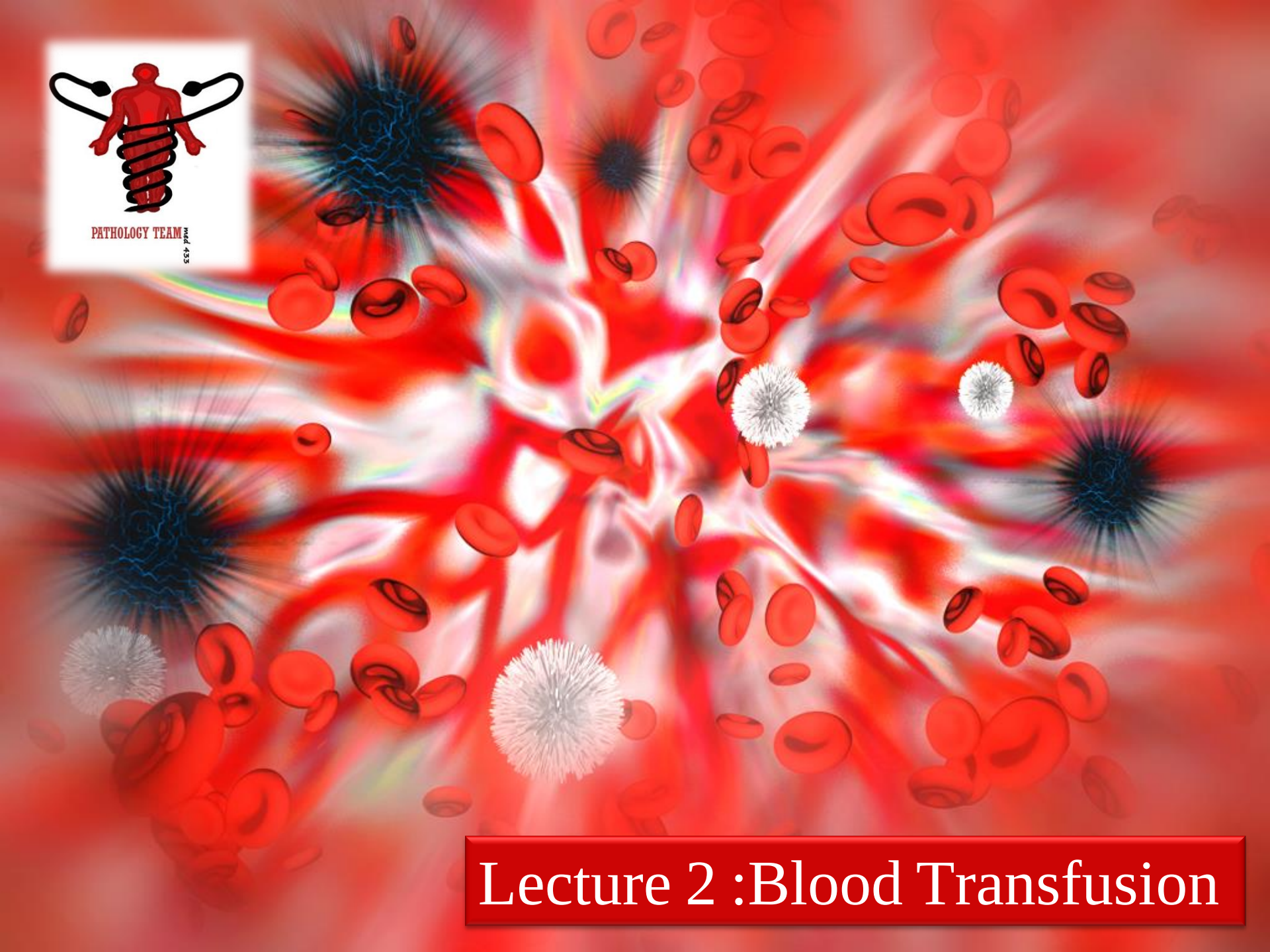
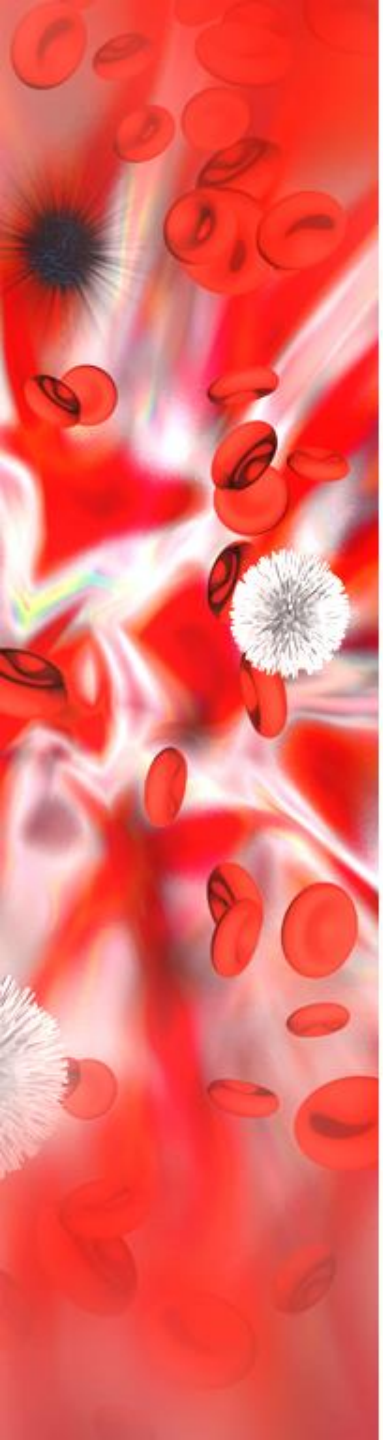


Lecture 2 :Blood Transfusion

Objectives

- Blood donors
- What are the criteria for blood donation?
- Who should not donate blood?
- Where is blood donate?
- Those who may be deferred include
- Blood groups
- ABO blood group system
- Blood Compatibility Testing (Crossmatch)
- The specific tests performed on donated blood
- Blood components (preparation)
- What types of tests are performed on donated blood?
- How is blood stored and used?



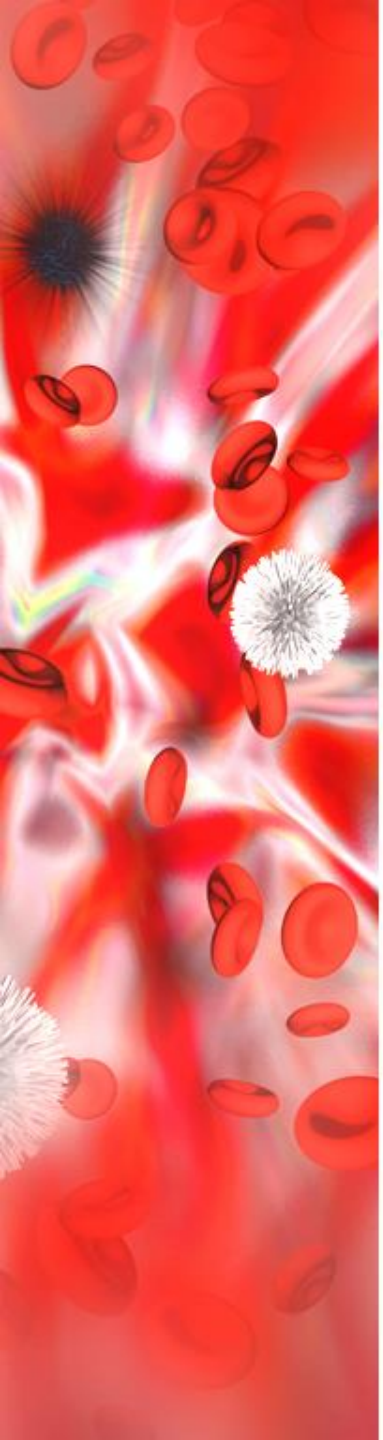
Blood donors:

Term	Used when	
voluntary donors	- outdoor voluntary	
	- hospital stuff	
	- recruitment campaigns	
involuntary donors	- Relatives for • elective surgery and normal deliveries. • Relative for emergency blood transfusion.	
	- for driving licenses.	
Directed blood donations	close relative on their requests.	
Autologous donations	Predeposited	for elective surgery can donate 4 units in one month before surgery (one unit/week).
	Haemodilution	Acute normovolaemic haemodilution*, 2-3 units of blood can be obtained immediately before surgery.
	-Salvage of the blood lost during surgery with special blood salvage devices.	
	Combination of the above methods.	

* ANH : technique in which whole blood is removed from a patient, while circulating volume is maintained with acellular fluid.

* Salvage :heavy blood loss during operation is collected to be reinfused

*Haemodilution: Increase in the volume of plasma in relation to RBCs reduced concentration of RBCs in the circulation



The criteria for blood donors:

1- good health.

2- age: at least 16 -70 years. It could be older but not younger 16

3-weight : at least 50 KG(110 pounds) but not obese or pregnant .

4- must pass the physical and health history examinations given prior to donation.

5- The donor's body replenishes the fluid lost from donation in 24 hours. It may take up to two months to replace the lost red blood cells.

6- Whole blood can be donated once every eight weeks (56 days).

7- Two units of red blood cells can be donated at one time, using a process known as red cell aphaeresis*. This type of donation can be made every 16 weeks.

8- Volunteer donors provide nearly all blood used for transfusion in KSA.

Who should not donate blood?

1-Anyone who has ever used intravenous drugs (illegal IV drugs).

2-Men who have had sexual contact with other men.

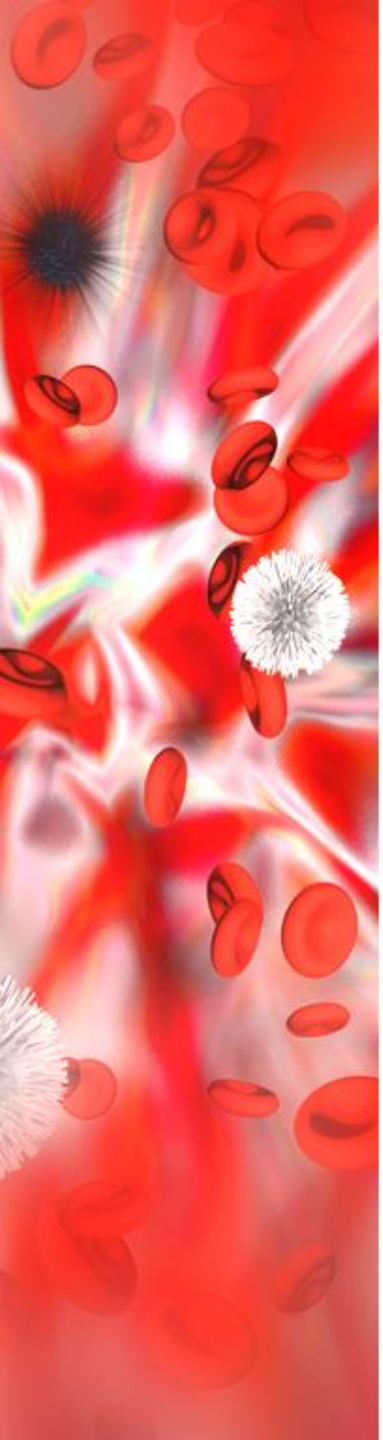
3-who has ever received clotting factor concentrates.

4- positive HIV test (AIDS virus)

5-Men and women who have engaged in sex for money or drugs.

6- who has had hepatitis.

* Extraction of a specific component from donated blood, with the remainder returned to the donor.



Those who may be deferred مؤجلة include:

Anyone who has taken Tegison for psoriasis. مرض الصداف

Anyone who has risk factors for Crueutzfeldt-Jakob disease (CJD) or who has an immediate family member with CJD.

Anyone who has risk factors for vCJD.

Anyone who spent three months or more in the United Kingdom from1980 through 1996.(This is applied in USA)

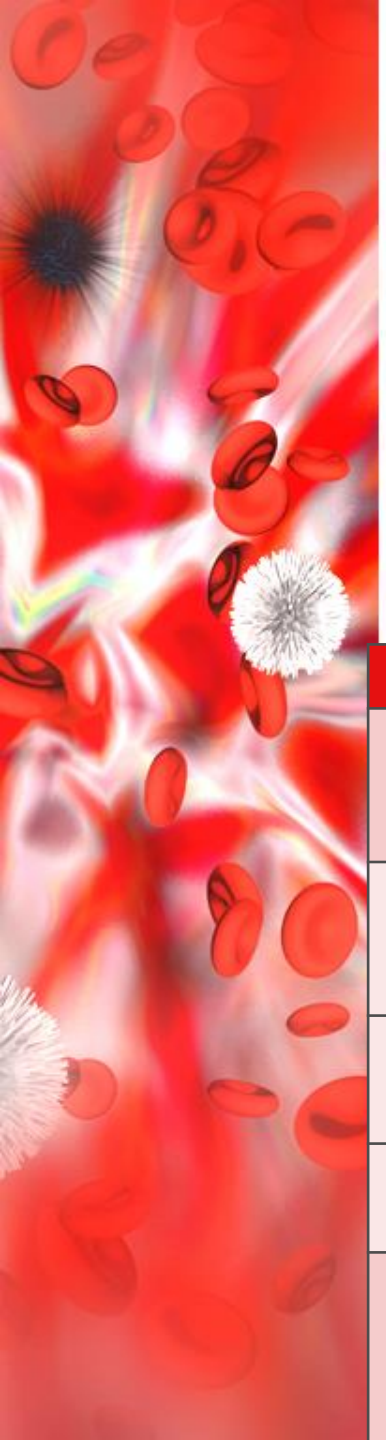
Anyone who has spent five years in Europeform 1980 to the present. (This is applied in USA).

Anyone who has had babesiosis (malaria like infection) or Chagas disease داء المثقبيات.

Also all the Contraindicated before

Donors temporary deferral:

Active disease under treatment	Any infectious disease treatment with antibiotics.
For one month	Rubella vaccination
For two month	Recent blood donation
For sex weeks	Following delivery
For one year	- Hepatitis B vaccine + Rabies vaccine. - close contact with viral hepatitis patient or AIDS. - Tattoo patient.
For three years	coming from malarial endemic area



Medication deferral list:

If the donor now taking or if he has EVER taken any of these medications:

- Any treatment for prostatic diseases or severe psoriasis (Tegison)

-Growth Hormone from Human Pituitary Glands: used usually for children with delayed or impaired growth.

-Insulin treat diabetes.

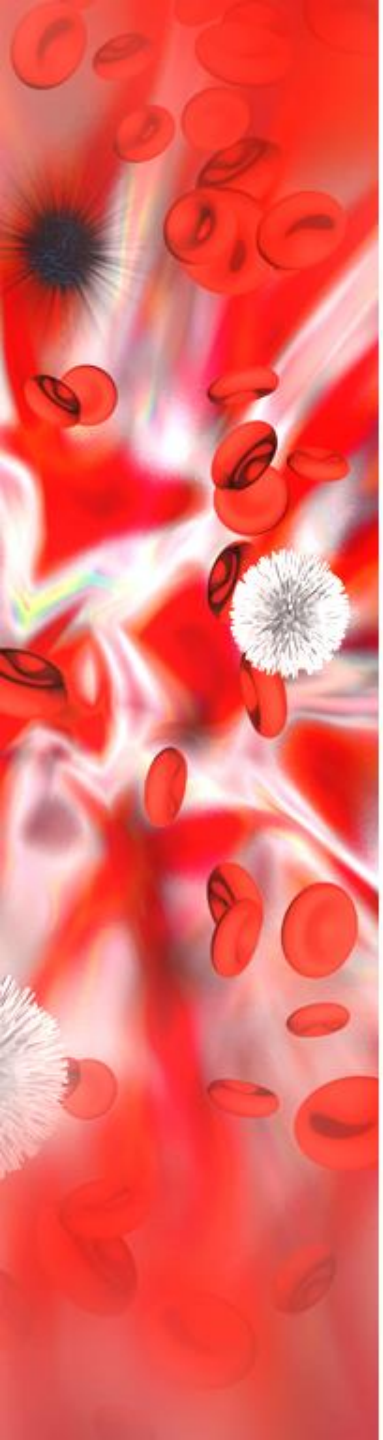
-Hepatitis B Immune Globulin: given following an exposure to hepatitis B.

-Unlicensed Vaccine: usually associated with a research protocol.

Types of anti-coagulants :

The bags that receive the donors blood should be putting in shaking machine to mix blood with anticoagulants substances which found in these bags ..

Types	Contains	Store	Duration	Notes
ACD - A (NIH - A)	Citrate Dextrose Water	RBCs	21 days	67.5 ml of this solution are mixed with 450 ml of Blood
CPD	CITRATE – PHOSPHATE – DEXTROSE	RBCs Platelets	28 days 3days	The same
CPDA-1	Citrate Phosphate Dextrose Adenine	RBCs Platelets	35 days 5 days	The same
Optisol AS – 5	CPDA-1 + Optisol	RBCs	42 days	-
(CPDA-2) Plus Optisol	CITRATE – PHOSPHATE – DEXTROSE + Optisol	RBCs Platelets	42 days 5 days	The same



Blood Groups

Blood grouping by using different systems . The most important two systems are ABO and Rh *systems.

* Determines by “D” positive or negative

The most common blood types:

O Rh-positive 38%

A Rh-positive 34%

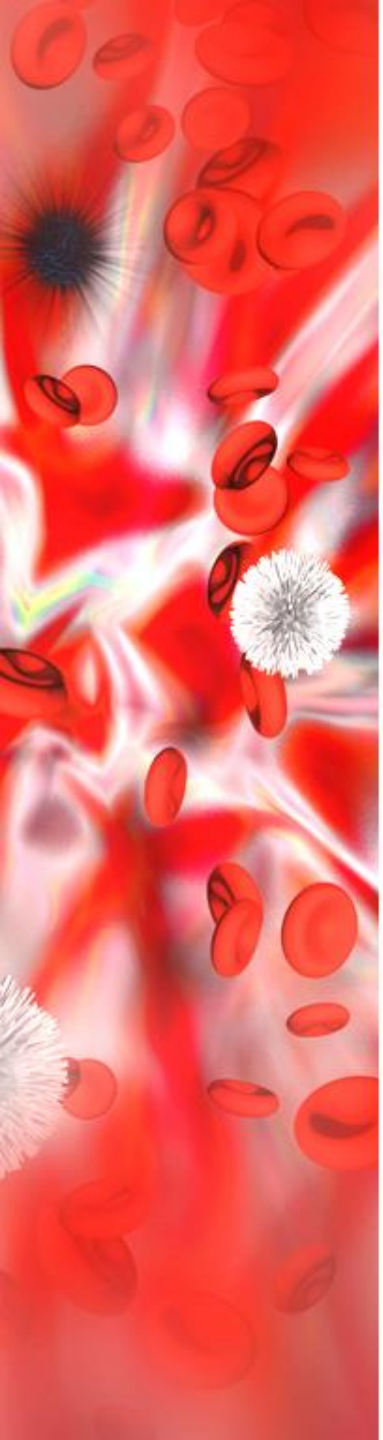
ABO system

Blood group	Antigen(s) present on the red blood cells	Antibodies present in the serum	Genotype(s)
A	A antigen	Anti-B	AA or AO
B	B antigen	Anti-A	BB or BO
AB	A antigen and B antigen	None	AB
O	None	Anti-A and Anti-B	OO

The difference between A and B:

A: Has a galactosamine group (GalNAc)

B: Galactose



BLOOD TRANSFUSION

Before doing blood transfusion, many tests should be done:

1- Compatibility Testing (Crossmatch test)

Even if you know the blood group of donor and recipient , this test should be done.

Except in emergency situations by giving O negative .

By mixing RBCs the donor with plasma of the recipient (if there is no reaction that means transfusion could be done .

Two terms used in this test :

Term	Means
Front Type	antigens ("flags") in the ABO blood group system are on the **patient's** Red Blood Cells
Back Type	Antibody in the **patient's** serum

2- syphilis test
3- HIV tests
4- Hepatitis B core antibody and surface antigen (2 tests)
5- Hepatitis C virus antibody
6- Nucleic acid amplification testing (NAT) for HIV-1 , HCV and WNV(West nile virus).
7- G6PD test. Because if there is a deficiency, the transfusion will be useless
8- Sickle cell test.

Compatibility Testing

To be Completed Before Blood or Blood Products can be Transfused:

* crossmatch test.
* Antibody screening on patients sera. (indirect comb's test)
* Directs comb's test on (donors red cells and patients red cells)
* Screening for antibodies that may produce adverse effects if transfused.
* Screening for possible infectious agents that could be transmitted with transfusion.

Blood Components

Preparation:

After donation, we take the blood bags and put it in the Cytospin to separate the blood components.

-RBCS stored under refrigeration for a maximum of 42 days, or they may be by frozen technique (new) up to10 years.
-PLATELET stored in room temperature 37 degrees for 5 days
-PLASMA stored in the freezer -30 degree for 1 year. (with Clotting factors)

from frozen plasma :

¬Cryoprecipitated AHF, which contains only a few specific clotting Factors
¬Granulocytes are sometimes used to fight infections. They must be transfused within 24 hours of donation.

Blue used for emergency (o-)

*Age of RBCs (120 days) platelet (10days) leukocytes(22hours)

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Good luck …