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**Lab 1-2**  
**Blood bank**

**Blood bank** : Is a part of hospital laboratories where we can **Collect ,Test, Store** the blood for **Transfusion.**

**Q\ Why we need a blood transfusion?**

- Most adult have about 5 L blood circulating in the body .
- Once its drop, the patient need to be transferred with blood immediately
- The blood level may drop due to:-
  - Accident
  - Blood loss :e.g. surgery, pregnancy
  - patient with cancer e.g leukemia
  - Anemia, thalassemia

**Q\ How blood bank works?**

- Donation
- Testing
- Processing
- Storage
- Transfusion

**1- Donation:**

blood donation is a voluntary process that can help save the lives of others

**Donor selection:** The first step in blood donation is the proper registration and identification of the donor through filling a special form (questionnaire).

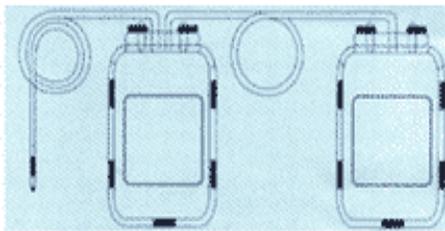
The donation process should be safe and cause no harmful side effect on donor + safe to the recipient .  
So , there is some criteria for selection of the donors and this will be done by some procedure:

- Doing questionnaire
- history medical Taking
- Doing physical examination

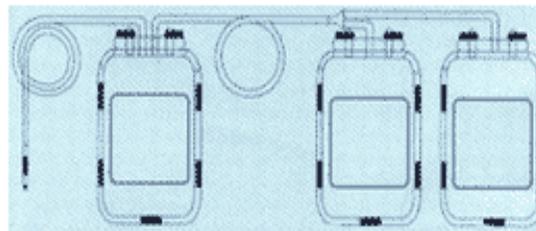


**Blood collection bags:** blood is collected from donors in a special disposable plastic bags:

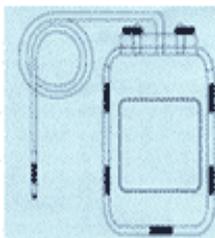
- The bags are sterile                      Transpar                      en with an enclosed system.
- Blood bag is designed to occupy one unite of blood (450ml).
- Inside the main bag there is an additive solution for preservation of blood.
- In blood bank we have to store blood for long time, so, that we need some special types of anticoagulants for blood bag.



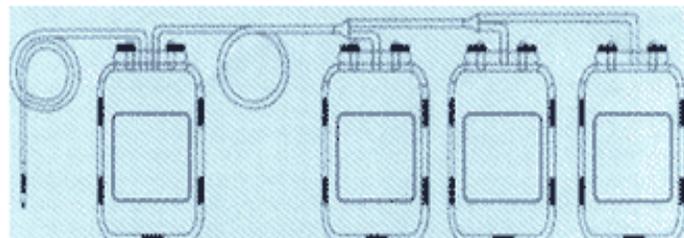
**Double blood bag**



**Triple Blood Bag**



**Single Blood Bag**



**Quadruple Blood Bag**



### Types of anticoagulants in blood bank:

- 1- ACD (Acid citrate dextrose). Self-life: 21 days at 4°C
  - 2-CPD (citrate Phosphate dextrose) .Self-life: 21 days at 4°C
  - 3- CPDA-I (citrate Phosphate dextrose adenine ). Self-life: 35 days at 4°C
  - 4- CPDA-II (Citrate Phosphate dextrose adenine) .Self-life : 42 days at 4°C Addition of more amount of Adenine
  - 5- CPD-SAGM (citrate Phosphate dextrose) Additive solution
  - 6- SAGM: Saline Adenine Glucose Mannitol .Self-life : 42 days at 4°C
- Purpose of additive solution, to improve RBCs storage viability till 42 day, Mannitol- Sugar, reduce hemolysis & increase self-life of blood.

**2- Testing:** the donated blood will go many tests to ensure that the blood is safe and helps many people as possible.

The tests include ( **for example** ) :

- ABO grouping
- Rh typing
- Hepatitis and antibody testing
- AIDS
- Syphilis

**3- Processing:** various blood component can be prepared from single donation of whole blood when its separated by **centrifugation into** (RBC, Platelets, Plasma).



**4- Storage:** each blood component has a specific storage temperature and expiry date:

- RBCs: **1-6 C for 35 days**
- Platelets: **25 C for 5 days (with continuous shaking)**
- Fresh frozen plasma (FFP) :For a 1 year
- Cryoprecipitate :For a 1 year

**5- Transfusion:** each blood component will go to the most suitable patients they need and this decision is done by the physician.

### Plasma and Serum separation methods

#### **Requirement:**

- Disposable gloves
- Tourniquet
- Syringe
- Cotton
- Alcohol (70%)
- serum blood tube (red or gold).
- Plaster

#### **Procedure:**

##### **Plasma separation steps (plasmapheresis):**

1. Whole blood collected into anticoagulant-treated tube.
2. Centrifuge the tube for 10 minutes at 3000 rpm.
3. After centrifugation transfer the liquid components supernatant (plasma) into another tube using pasture pipette.

##### **Serum separation steps:**

1. Collect whole blood in a plain tube without anticoagulant
2. Allow the blood to clot by leaving it undisturbed at room temperature or laboratory water bath.
3. centrifugation at 3000 rpm for 10 minutes
4. Transfer the supernatant (serum) into another tube using pasture pipette.



## Lab 2 BLOOD DONATION

- Blood donors shall be recruited from suitable healthy individuals that do not have any risk of infection with HIV, HBV, HCV and Syphilis.

### Donor Criteria

Blood donation must be on a voluntary no remunerated basis. The criteria for donor acceptance are:  
Age: between 18 to 65 years. Between age 60 – 65 years: requires a yearly medical checkup which includes chest X-Ray, ECG, LFT, Renal Profile, Fasting Serum Lipid, Fasting Blood Sugar and Full Blood Count

Gender: Male and Female.

Weight : Minimum 45 kg

General appearance: Donors must appear to be in good health.

Donors must not have medical history, these include inherited bleeding disorders, recent illness or consumption of medication.

Blood donors must have a minimum of 5 hours of sleep.

Hemoglobin level must be between 12.5g/dl – 18.0g/dl.

The interval between the last donations of whole blood should not be less than 8 weeks and not less than 2 weeks for plasma or platelet donation.

بنك الدم  
استمارة متبرع

التاريخ \_\_\_\_\_  
المهنة \_\_\_\_\_  
رقم الهاتف \_\_\_\_\_

العمر \_\_\_\_\_  
اسم المتبرع (رباعي)  
المنوان \_\_\_\_\_

يرجى الاجابة على الاسئلة التالية:-  
١- هل سبق وتبرعت بالدم وهل حدث ردود فعل مميّنة نتيجة التبرع مثل الدوخة والاشياء وغيرها?  
٢- هل اجريت لك عمليات جراحية ما هي تاريخها  
٣- هل تناولت ادوية خلال ٧٢ ساعة الماضية ما هي السبب  
٤- هل تتناول ادوية بشكل مستمر ما هي  
٥- هل اصبحت بأحد الامراض التالية:  
١- الحساسية  
٢- الملاريا  
٣- امراض نزف الدم  
٤- التهاب الخصيات المزمن  
٥- امراض في القلب او الشرايين والشحطات  
٦- التهاب احشية القلب  
٧- كياس كلية  
٨- فقر الدم - وما زلت تحت المعالجة  
٩- اي امراض اخرى اذكرها

٢- السرطان  
٣- اليرقان  
٤- الالتهام الصدرية  
٥- ارتفاع في الضغط  
٦- السكري  
٧- الدوخة او فقدان الوعي  
٨- السيل البروتي  
٩- القرحة  
١٠- امراض الدم  
١١- الحصى المرارية  
١٢- امراض جلدية  
١٣- السيلفوس (الزهري)  
١٤- امراض الكلى  
١٥- امراض الكلى

اقرار: انا الموقع اذناه  
واوافق على سحب وحدة من دمي للمريض

اقر بانني قد اجبت عن الاسئلة اعلاه بكل صدق  
التوقيع \_\_\_\_\_

استعمال بنك الدم  
وزن المتبرع \_\_\_\_\_ كغم  
ضغط الدم \_\_\_\_\_  
النقيش \_\_\_\_\_  
مناسب  
مرهوض مؤقّتاً السبب \_\_\_\_\_  
مرهوض نهائياً السبب \_\_\_\_\_

مكده الدم (PCV) \_\_\_\_\_  
اسم وتوقيع الفني: \_\_\_\_\_  
اسم وتوقيع الطبيب \_\_\_\_\_



### Pre-Donation Questionnaire & Interview

All potential blood donors are interviewed by the blood bank personnel before donation. The Blood Bank must ensure that all potential blood donors:

Take blood samples for testing of viral markers as HIV, Hepatitis B, Hepatitis C and Syphilis.

have their ABO blood group performed

have their haemoglobin levels determined

have their weight measured

The donated blood should be removed and disposed if we feel would cause harm to the recipient. This includes medical reason such as abdominal pain, feeling unwell or develops medical illness after donation.

Directed blood donation is not recommended except in certain special circumstances e.g. rare blood groups.

**Equipment:**-All equipment's such as centrifuge, platelet agitator, freezers, refrigerators as well as cold room and freezer room must be validated. Maintenance, cleaning and calibrating should also be performed regularly and recorded.

**Labelling:** - All products must be adequately labelled and the following information should be shown on the label

- A unique number to ensure traceability
- The date of collection
- The ABO group and Rh
- The name of blood component
- The volume or weight of blood component
- The unique identity number must be maintained for all component derived from the blood bag.
- The date of expiry labelling of blood product must be done .

