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# COLLECTION OF BLOOD FROM DONORS

## 6.1 INTRODUCTION

Collection of blood from donors is one of the most important functions of the blood bank.

Failure to follow approved procedures can lead to severe and potentially fatal consequences in the recipient and also the donor.



## OBJECTIVES

After reading this lesson, you will be able to:

- describe the procedure of collection of blood from donors as per recommended guidelines.
- discuss the care and storage of the collected blood
- explain the care of donors after donation of blood

## 6.2 BLOOD COLLECTION

The process of blood collection begins with donor information and counseling.

### A. Pre-Donation Information

- Written or verbal information is given to blood donors before donation regarding their rights, the procedure of donation and tests which will be done on the collected unit of blood.

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- The donor must sign the donor form indicating that the donation procedure has been understood and he agrees to donating blood and to testing for infectious agents that can be transmitted by transfusion.

#### B. Pre-Donation counseling

- Counselling is provided to potential donors in privacy before blood donation. The possible consequences of learning test results must also be explained to them.

#### Equipment required for collection of blood

1. **Blood collection bags:** PVC plastic bags which are closed system of single, double, triple, or quadruple bags for collection of 350 ml or 450 ml blood are available commercially. These bags contain an **anticoagulant solution, citrate phosphate dextrose –adenine (CPDA-1)**. The volume of anticoagulant is 49ml for 350ml of blood and 63ml for 450ml of blood. The **shelf life** of blood collected in this is **35 days**.
2. Sphygmomanometer
3. Machine for mixing of blood
4. Weighing scale
5. Sterile cotton swabs, spirit and band aid
6. Plastic clips

**Blood Collection Room:** The room where blood is collected should be clean, well lit and preferably air-conditioned so that the donor is comfortable during the collection process.

**Collection personnel:** Blood should be collected only by a medical officer or adequately trained persons in the presence of the medical officer.

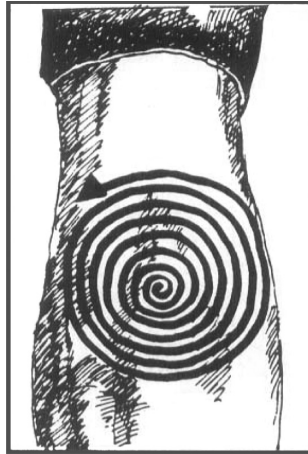
**Donor identification:** The name, age, sex of the donor should be entered prior to collection and a number assigned to each donor. Mention this number on the blood bag and pilot tubes.

#### Method of phelobotomy

1. Wash hands well with soap and water and wear sterile gloves.
2. Inspect the bag for any leak or damage. The anticoagulant solution must be clear and not have any particulate matter.
3. Make the donor lie down comfortably.

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4. Identify the donor. The number on the bag must correspond with that on the form. Write the date of collection and expiry on the bag. Also mention the blood group of the donor, if known.
5. Place the bag on a balance.
6. Choose the site of venipuncture in the antecubital area of the arm after careful inspection of both arms. It should have no local infection/scars.
7. Apply a sphygmomanometer cuff 1 1/2 inches above the area and inflate to 50-60 mm Hg. This will help in identification of the vein. The vein should be large and firm but not superficial.
8. Deflate the cuff and clean 4-5cms of the area in a circular, centrifugal manner i.e. starting at the site of venipuncture and moving outward (Fig. 6.1). Clean with spirit first, then iodine and again with spirit. Allow to dry for 30 seconds. Do not touch the cleaned area after preparation.



**Fig. 6.1**

9. Inflate blood pressure cuff to maintain a pressure of 50-60mm Hg. Remove the cap from the needle just before the venipuncture and insert into the vein.
10. Ask the donor to open and close fist during collection of blood.
11. Mix blood and anticoagulant at periodic interval during collection. This can be done manually or with an automated mixing equipment.
12. Do not leave the donor unattended during the entire procedure which takes 8-10 minutes
13. Monitor the volume of blood being drawn using a balance or blood collection monitor Scale. (One ml of blood weighs 1.05 g .Thus, 350 ml of blood weighs 367 g. and 450 ml weighs 472 g).
14. After the requisite amount of blood has been collected, clamp the tubing attached to the bag with a plastic clip.

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15. Deflate the cuff, place a sterile swab at the puncture site and apply pressure over it and ask the donor to raise the arm
16. Let the donor remain on the couch for 5-10 min after the collection. Apply a band aid over the site after bleeding stops.
17. Provide light refreshment to the donor.

### Care of the collected unit of blood

1. Take the bag to the processing table
2. Loosen the plastic clip and with light pressure on the bag transfer 4-5ml of blood to the pilot tubes for blood grouping and transfusion transmitted infections. Recheck that the number on the tube is the same as that on the bag.
3. Seal the tube with a sealer and separate the needle.
4. Strip the blood bag tubing, pushing the blood back into the bag. Mix the blood in collected bag by gentle inversion.

## 6.3 LABELLING OF BLOOD BAG AND IT'S STORAGE

### Labeling of blood bag

A sticker is placed on the collected unit of blood. Each blood group is designated with a different color

Pink : Blood group A

Yellow : Blood group B

Blue : Blood group O

White : Blood group AB

### The following information is written on the bag:

Donor number

Date of collection

Date of expiry

Blood group

Negative for transfusion transmitted infections

### Storage of collected blood

Keep the blood bag at 2-6°C in the refrigerator immediately after collection. Blood is stored in a blood bank refrigerator in which the temperature is

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controlled. An inbuilt alarm is also present to alert the laboratory staff in case the temperature rises above the range. Blood of the same group is stored in one shelf. The shelf life of blood is 35 days.

If platelets are to be harvested, blood bag should be kept at 20-24°C until platelets are separated.

Adequate storage ensures that the therapeutic efficacy of blood and its components is maintained.

### Donor reactions

Most donors tolerate the procedure of blood donation well. However, some donors may develop reactions during or after donation of blood. These can be mild such as **feeling of faintness or dizziness**. The donor may complain of weakness, profuse sweating and pallor. Sometimes these vasovagal attacks are accompanied with **loss of consciousness**. The skin feels cold, pulse rate is increased and the blood pressure may fall. The donor's head should be placed in a low position with the legs raised and fluids/light food may be given. Tight clothing must be loosened. Blood pressure, pulse and respiration must be monitored closely till the donor recovers. Cold compresses may be applied to the donor's head if required. Reassurance of the donor with sufficient rest before he leaves is essential.

A **hematoma** can form at the site of venipuncture. Application of firm pressure after donation helps prevent this. If required, ice may be applied to the site for 5 minutes.

**Nausea and vomiting** may also occur. The donor must be made comfortable and an emesis basin may be provided. The head must be turned to one side to prevent aspiration. Ask the donor to breathe slowly and deeply.

**Muscular spasm** or twitching may be seen in some donors.

**Convulsions** can be seen in some donors. This is an emergency and the blood bank physician must be informed immediately. Adequate help must be sought while providing necessary assistance so that the donor does not injure himself.

**Sudden cardiac arrest** is a very rare reaction.

All donor reactions must be recorded. Written instructions must be provided by the blood bank physician for managing these reactions.

### Instruction to donors after donation

1. Increase intake of fluids for next 48 hours. No extra/special diet is needed.
2. Do not smoke or drive for next half an hour.

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3. Do not drink alcohol for next 24 hours.
4. Do not go for a flight for next 24 hours if the donor is pilot by profession.
5. Avoid strenuous exercise/lifting heavy weights for 24hours.
6. If bleeding occurs from phlebotomy site raise the arm and apply pressure on the venipuncture site.
7. If feeling faint or dizzy lie down with legs slightly raised above the head level. If symptoms still persist consult nearest doctor, blood bank doctor or clinician.

#### Tests to be performed on donor blood

The following tests are done on blood collected in pilot tubes:

1. ABO grouping
2. Rh grouping
3. Screening for transfusion transmitted infections: Hepatitis B virus (HBsAg), hepatitis C virus (HCV), Human Immuno Deficiency virus (HIV-1,2), syphilis and malaria



#### INTEXT QUESTIONS 6.1

1. A 45 kg donor can donate
  - (a) 350 ml of blood
  - (b) 450 ml of blood
  - (c) 400 ml of blood
  - (d) 300 ml of blood
2. The shelf life of blood collected in CPDA-1 is
  - (a) 35 days
  - (b) 40 days
  - (c) 36 days
  - (d) 21 days
3. The collected blood is screened for all except
  - (a) HIV
  - (b) HBsAg
  - (c) HepatitisA virus
  - (d) Malaria
4. Anticoagulant used in blood is
  - (a) EDTA
  - (b) CPD
  - (c) Heparin
  - (d) CPDA-1
5. If platelets are to be prepared from the blood, it is stored at
  - (a) 2-6°C
  - (b) 20-22°C
  - (c) 8-10°C
  - (d) Any of the above



**WHAT HAVE YOU LEARNT**

- Blood collection entails that proper procedures from selection of the type of bag to be used to the post donation instructions to the donor is strictly implemented. Special attention to the labeling which allows donor identification must be given, as also maintenance of an aseptic and closed system for actual collection of blood to minimize any risk to the donor / recipient. The donor blood can be stored for 35 days at 2-6°C. The blood collected in pilot tubes must be screened for transfusion transmitted infections and blood grouping must also be done. Adverse reactions can occur in the donor during or after donation which must be managed.



**Notes**



**TERMINAL QUESTIONS**

1. Explain briefly the tests performed on blood donors.
2. Explain the care of donors after donation



**ANSWERS TO INTEXT QUESTIONS**

**6.1**

1. (a) 350 ml of blood
2. (a) 35 days
3. (c) Hepatitis A virus
4. (d) CPDA-1
5. (b) 20-22°C