

# Outline of Blood Parts and their Planning

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**Abstract:** The entire blood which is a blend of cells, colloids and crystalloids can be isolated into various blood parts in particular pressed red platelet (PRBC) concentrate, platelet concentrate, new solidified plasma and cryoprecipitate. Each blood part is utilized for an alternate sign; subsequently the segment partition has boosted the utility of one entire blood unit. Various segments need distinctive capacity conditions and temperature prerequisites for helpful viability. An assortment of types of gear to keep up appropriate surrounding conditions during capacity and transportation are stylish. The blood parts being unfamiliar to a patient may create unfriendly impacts that may extend from gentle unfavorably susceptible signs to deadly responses. Such responses are normally brought about by plasma proteins, leucocytes, red cell antigens, plasma and different microbes. To keep away from and decrease such intricacies, blood items are adjusted as leukoreduced items, illuminated items, volume diminished items, saline washed items and microbe inactivated items. The support of blood stock structures a significant worry of blood banking especially of uncommon blood bunches regularly and basic blood bunches during fiascos. PRBCs can be put away for quite a long time utilizing cryopreservation methods. New investigates in red cell societies and blood substitutes messenger new time in blood banking.

**Keywords:** Leucocytes Microbes Plasma Platelets Temperature

## 1. Introduction

Blood is a lifesaving fluid organ. Entire blood is a blend of cell components, colloids and crystalloids. As various blood segments have diverse relative thickness, silt rate and size they can be isolated when outward power is applied.[1]

In expanding request, the particular gravity of blood segments is plasma, platelets, leucocytes (Buffy Coat [BC]) and pressed red platelets (PRBCs). Useful proficiency of every part is reliant on suitable preparing and legitimate stockpiling. To use one blood unit properly and sanely, part treatment is to be adjusted universally.[1]

The segments are set up by centrifugation of one unit of entire blood. Single part required can likewise be gathered by apheresis methodology in blood givers.

### Choice of blood contributors

Deliberate fit contributor for either entire blood or Apheresis assortment is chosen according to the measures set

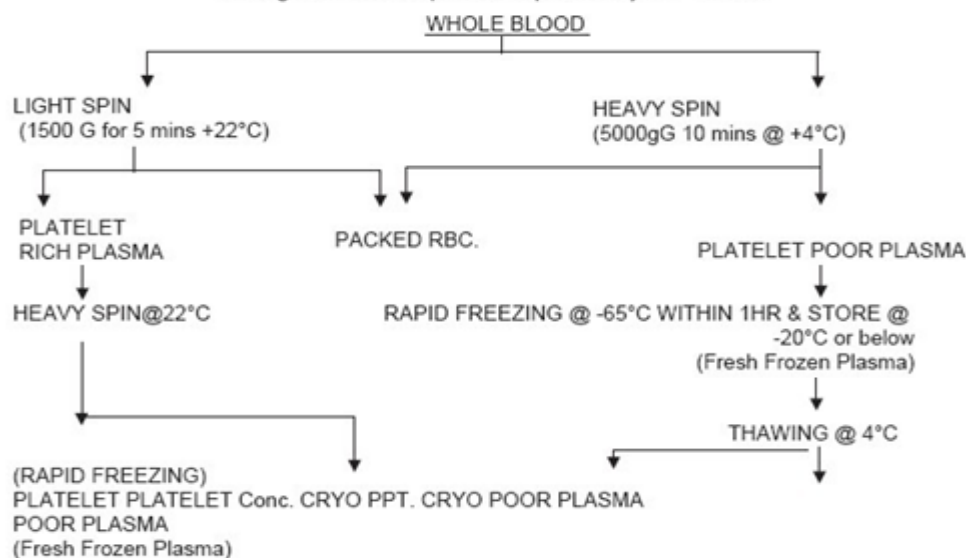
somewhere near medication controlling specialists and Public Guides Control Organisation.[2]

### Entire BLOOD TO Parts

Blood part arrangement was created in 1960 to isolate blood items from one unit entire blood by a particular hardware called as refrigerated centrifuge.[3] Planning just PRBC and new solidified plasma (FFP) is by single-step hefty turn centrifugation; anyway getting ready platelet concentrates (PLTCs), PRBC concentrates and FFP is by two stage centrifugation. The two primary systems of getting ready PLTC are either by platelet-rich plasma (PRP) technique or BC strategy. The calculation for the division by the two techniques is given as Calculation no. no.11 and and2.2. PRP technique is basic, effortlessly done physically and relatively less expensive, however platelet and plasma yield is less. BC is a superior technique yet confounded whenever done physically and subsequently needs mechanization.

### Calculation No: 1

An Algorithm for Component Preparation by PRP method

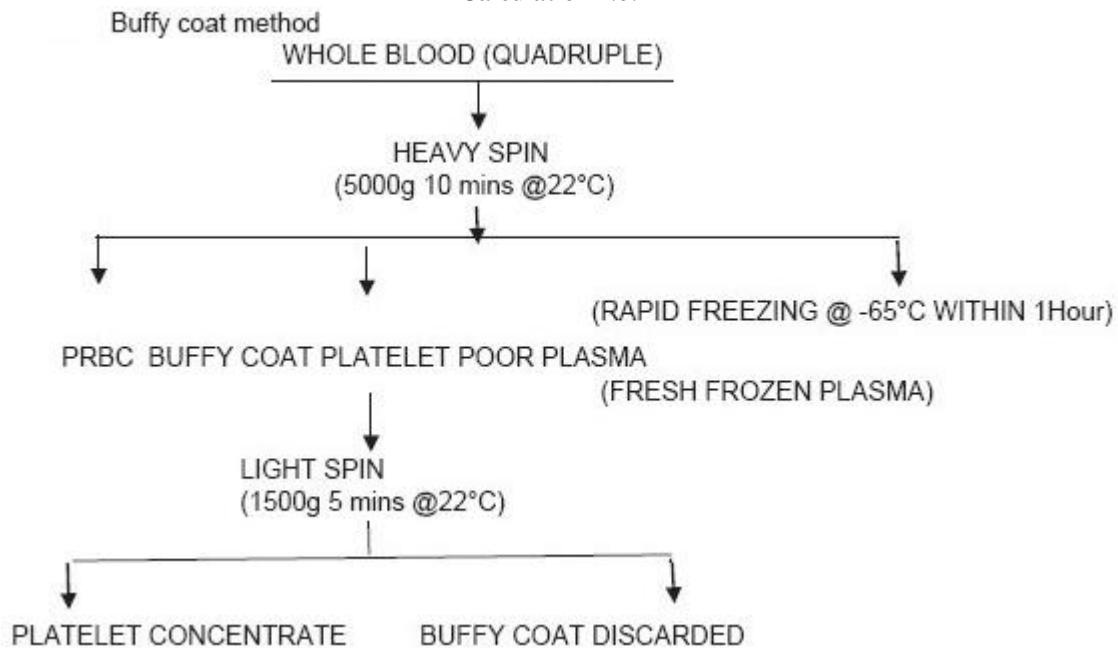


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## Calculation No: 2



The primary segments are PRBC, PLTC or irregular benefactor platelet (RDP), FFP, cryoprecipitate, cryo helpless plasma (CPP) and Plasma fractionation items. The last are created distinctly at the drug businesses end.

#### GENERAL Standards OF Part Planning

The Entire blood is gathered as 350 ml or 450 ml in twofold/triple/fourfold or penta sacks with CPDA-1 or added substance arrangement. After blood assortment, segments ought to be isolated inside 5 - 8 hours. Segment room ought to be a different purified room. All safety measures to maintain a strategic distance from red cell tainting must be accepted, for example, tapping the section closes, appropriate adjusting of inverse packs, observing standard projects and conventions depicted in the manual of refrigerated axis maker. The program is run with fundamentally two twists substantial turn (e.g., 5000 G for 10-15 min) and light turn (e.g., 1500 G for 5-7 min). The substantial and light turn design changes with producer and model. Here 'G' is relative radiating power determined utilizing cycles every moment and rotor length. Utilization of completely mechanized part separator instrument will take into consideration the arrangement of low volume BCs with a recuperation of 90% of entire blood platelets.[4]

#### Segment Assortment BY APHERESIS Strategy

Apheresis is where required single or more than one part is gathered, and the remainder of blood segments are returned back to the contributor.

The working rule of apheresis gear is either by centrifugation (diverse explicit gravity) or by filtration (distinctive size). The most generally utilized supplies utilize the centrifugation guideline and furthermore give leucodepleted items. In this technique, fixed amount of blood is gathered in a bolus called as Extracorporeal volume (ECV) and the necessary part (for example Platelets) is isolated and gathered in the assortment sack and different parts (for example red platelets, leucocytes and plasma) are returned back to the contributor. Centrifugation apheresis

types of gear are named 'discontinuous and ceaseless working'.

The Discontinuous hardware utilizes single vein access for both assortment and return. One cycle comprises of-one ECV entire blood assortment in unit bowl, centrifugation of bowl to isolate parts, assortment of required segment (platelets) in assortment sack lastly return different constituents like red cells, leucocytes and plasma to giver. This cycle is rehashed till helpful portion is achieved.

In ceaseless working hardware, two concurrent phlebotomies are done: One for the assortment and other for the return. The assortment, centrifugation, part assortment and return happen persistently and all the while. Each type has its own bit of leeway and constraint.

A definitive objective of the method isn't to overshoot ECV assortment over 15% of complete blood volume (TBV). To stay away from hypovolemia anytime ECV ought not lessen past 20% of TBV and the last item ought not surpass 15% ECV of TBV.

The different segments that can be gathered are - twofold unit red cell assortment (red cells), single contributor platelet (SDP) reaping platelets, leucapheresis (reaping granulocytes, fringe blood haematopoietic undifferentiated organism), plasmapheresis (gathering ordinary plasma) and restorative plasma trade (for trading with typical plasma subsequent to gathering and disposing of patient's plasma).

#### General rules

Aside from being fit according to the entire blood gift models, extra rules to be met for apheresis givers incorporate conspicuous available vein for withstanding apheresis technique and weight in excess of 55 kg.

Regardless of severe rules for givers of apheresis strategies, progressed types of gear like constant apheresis hardware have permitted muddled methods (like remedial

erythrocytapheresis and leucapheresis of little youngsters for thalassemia and leukemia individually) to be performed securely in kids gauging 11-25 kg without expanded morbidity[5]

The contributor ought to be approached to sign an assent structure in the language which he comprehends subsequent to being clarified the system and the dangers involved.[2]

Certain examinations ought to be done and all boundaries ought to be inside the satisfactory range preceding oppressing the giver for apheresis method, for example, complete blood tally, all out proteins including egg whites, globulin, same ABO gathering. (on the off chance that vital same Rh composing and negative atypical neutralizer status), bonding sent ailment screening (obligatory and to be non receptive). minor cross match (to be viable, If important major ought to be viable if there should arise an occurrence of red cell tainted item).

#### For twofold unit red cell assortment

Givers ought to have the hemoglobin level of 13.5 g/dl or more, gauge in excess of 65 kg. also, the stretch between the two methods ought to be a half year.

#### For plateletpheresis

- Donor's platelet tally ought to be 150,000/mm<sup>3</sup> or more and all out white cell tally, and differential tally ought to be inside typical limits[2]
- Donors who have ingested anti-inflammatory medicine or comparative antiplatelet drugs in the last 72 h and clopidogrel or ticlopidine, the plateletpheresis ought to be conceded for 3 and 14 full prescription free days, separately. Plateletpheresis ought not be done on benefactors with individual and family background of draining inclination
- In a contributor who goes through plateletpheresis, the methodology can be rehashed after 48 h. This is limited to a limit of two systems for each month and 24 strategies in 1 year.

#### Leucapheresis

- Granulocyte concentrate is gathered for the most part by apheresis and signs are uncommon; One such sign is to help patients with unusual neutrophil work and steady infection[6]
- Peripheral blood immature microorganisms (PBSC) are collected utilizing consistent or discontinuous cell separator. Least yield ought to be  $2 \times 10^6$  CD34 cells or  $2 \times 10^8$  MNCS/kg body weight of the recipient[2]
- Donors for leucapheresis, both autologous and allogeneic PBSC reap may get drugs like development factors (G-CSF), hydroxyl ethyl starch, dexamethasone and so forth., to encourage this gathering. A few contributors may have antagonistic responses to such medications. Satisfactory insurances to oversee such circumstance must be taken or givers may must be dismissed now and again.

#### Plasmapheresis

Any contributor who has gone through plasmapheresis can go through 'sequential' Plasmapheresis gave, before every system:

- The hemoglobin level isn't under 12 g/dl or haematocrit 36% and complete serum protein not under 6 g/dl
- The greatest plasma that can be gathered per method is 500 ml in a benefactor gauging in excess of 55 kg
- Any fit benefactor can go through a limit of two strategies for every week and 24 systems in 1 year.[2]

#### Multicomponent blood assortment by apheresis

Apheresis technique permits the assortment of various blood segments from a similar contributor during a solitary meeting. RBC units can be simultaneously gathered with plasma and additionally SDP units.[7]

Benefactors ought to be watched intently during apheresis for unfriendly occasions, for example, citrate poisonousness showed as perioral paresthesia, shivering, jerks and migraine, blacking out assaults, tachycardia, dyspnoea and so on., The contributors ought to be tried properly to recognize looming cytopenia. Red platelet misfortune accidental to the technique ought to be close to 25 ml for each week.[2]

The different Blood parts that can be set up from segment readiness or apheresis strategies are as per the following:

- PRBCs, twofold unit red cell (apheresis)
- PLTC or RDP, SDP (apheresis)
- Granulocyte concentrates (presently phenomenal), autologous or allogeneic fringe blood hematopoietic undeveloped cell assortment PBHSCT (apheresis)
- FFP, cryoprecipitate, CPP.

Plasma Fractionation Items are delivered in the drug business from FFP. At present, plasma fractionation is driven by interest for two protein concentrates-egg whites and immunoglobulin.[8] (Allude Table 1 for arrangement and signs of utilization of different plasma products.[9].

**Table 1:** Different plasma items and their signs

Product	Composition	Indication
Albumin	5% or 25%	Volume expansion; fluid mobilization
Factor VIII	Factor VIII	Haemophilia A; von Willebrand's disease (selected products only)
Concentrates Recombinant Human factor VIII	Some fibrinogen and von Willebrand factor	
Factor IX complex, X Factor IX concentrate	Factor II, VII, IX, minimal amounts of other proteins	Hereditary factor II, IX, or X deficiency, factor VIII inhibitor
Immunoglobulins	IgG antibodies, for IV or IM use	Treatment of hypoglobulinaemia or agammaglobinemia, immune-thrombocytopenia (IV preparation only)
Rh immune globulin	IgG anti-D preparation	Prevention of HDN due to D antigen

HDN – Haemolytic disease of the newborn; IM – Intramuscular; IV – Intravenous

**Other human plasma derivatives [10]**

These incorporate FEIBA (factor VIII bypassing movement) concentrate, Antithrombin, Fibrinogen, Fibrin sealant (FS), Protein C, C1 esterase inhibitor.

Blood items can be adjusted to make blood bonding more secure and open to dodge unfavorable bonding responses in patients defenseless for them. The items can likewise be adjusted for better helpful results by leucodepletion, volume consumption, light, cryopreservation, revival, and so forth.

**Pressed red platelet or platelet concentrate with buffy coat eliminated**

By including added substance arrangements (ADSOL) or saline, adenine, glucose and mannitol arrangement (SAGM) PRBC can be put away for 42 days. Since BC contains most leucocytes, during the arrangement of segments by BC strategy, on the off chance that whole BC is disposed of, at that point each PRBC and PLTC unit will have leucocytes  $<1.2 \times 10^9$ . Such items are called leucocyte decreased yet not leucocyte exhausted. Leucocyte exhaustion is accomplished distinctly by filtration.

The primary preferences of BC expulsion are miniature total arrangement during capacity is extraordinarily diminished and febrile non-haemolytic bonding responses (FNHTR) are decreased with no additional exertion.

Regarding security and cost-viability, the most discerning methodology is by all accounts to suggest the utilization of buffy-coat-drained RBC to forestall FNHTR in okay patients, while leucoreduction by filtration ought to be confined to patients with the notable indications.[11]

**Leucodepletion of blood segments****Definition**

Every leucocyte exhausted blood item viz-PRBC or single portion platelet or grown-up remedial portion platelet ought to contain leucocytes  $<5 \times 10^6$  for each unit to forestall alloimmunisation to leucocyte antigens in patients where bondings are probably going to be ongoing.[12] This is accomplished by three strategies:

- Pre stockpiling: Quick filtration inside 48 h from assortment previously or after part division.
- Points of interest of pre stockpiling are:
- Complete quality confirmation
- Process is done when leucocytes have not separated or broken or cytokine delivered. Thus expected advantages are practically 100%
- No stockpiling sores and timeframe of realistic usability is unaltered.

**Disservices are:**

- Leucodepletion regardless of requests adds to cost and time
- Need all around prepared devoted specialized staff.
- On request additionally called as Lab side-This is done uniquely on request. Sacks with worked in channels guarantee a shut framework when utilized with sterile interfacing gadget (SCD) and are additionally simple to work

- Pre bonding likewise called as bedside: This is finished by spiking blood part pack with a specific bonding set having leucocyte channel with nonstop leucoreduction during bonding. Here the impact of cytokines can't be maintained a strategic distance from.

**Suggested signs for leuko reduction (gatherings/standards)**

- Patients requiring bonding and had at any rate two scenes FNHTR in past bonding
- In haematopoietic undifferentiated cell relocate beneficiaries requiring bondings
- To stay away from post bonding CMV contamination in immunocompromised patients
- All neonatal and pediatric bondings for youngsters not exactly a year.[12]

**Potential signs (gatherings/standards)**

- To keep away from human leucocyte antigen (HLA) alloimmunisation in patients requiring various bondings who may create platelet obstinacy
- To keep away from immunomodulation in beneficiaries and planned beneficiaries of strong organ (kidney), haematopoietic undeveloped cell relocate and patients with malignancies.
- Stuffed red cell concentrate/new solidified plasma/single giver platelet aliquots
- The PRBC portion for children and babies is 15 ml/kg. The complete blood necessity for a kid might be as low as 25-100 ml and the kid may likewise require numerous bondings. This can be accomplished by aliquoting one PRBC unit (Around 200 ml) into Pedi-packs. This will stay away from numerous benefactor presentations to the patient and furthermore assists with keeping up a stock
- PRBC aliquots or volume decreased segments might be required in patients with liquid over-burden and in competitors defenseless for bonding related circulatory over-burden (TACO).

**Platelet and cryoprecipitate pooling**

6-10 units of gathering explicit platelets or non-bunch explicit cryoprecipitate can be pooled utilizing SCD to make one unit of a remedial portion. The pooled platelets can be volume diminished to forestall TACO. Single contributor blood segments have for quite some time been viewed as the best quality level in bonding medication since they are related with lower chances for transmission of viral or bacterial diseases to bonding beneficiaries than pooled blood components.[13]

**Cryopreservation****Frozen red cell concentrate, or cryopreserved PRBC:**

Red cells can be solidified in the wake of treating with cryoprotective arrangements and can be put away for a very long time, if capacity temperature is kept up beneath  $-65^{\circ}\text{C}$ . The last item before bonding ought to be liberated from cryoprotective operator, with negligible indications of haemolysis and yield in any event 80% of the initially solidified cells.[14]



**Platelet cryopreservation:**

- Cryopreservation of platelets is basically utilized for autologous bondings for a couple of chosen patients who are headstrong to allogeneic platelets.
- Peripheral blood haematopoietic immature microorganisms are additionally cryopreserved for autologous or allogeneic transfers whenever needed to be put away past 3 days.

**Restoration of stuffed red platelet**

To restore the loss of intra-cell levels of 2,3-DPG and ATP because of capacity, revival arrangements can be utilized especially in pediatric patients and in gigantic bondings like trade bondings. Revival arrangements are predominantly accessible in USA and are FDA approved.[14]

**Platelet gel**

The term platelet gel (PG) is applied to items with the consistency of gelatin-like material, which is produced when thrombin and calcium are added to PRP.[15] PG is utilized in reconstructive and muscular methodology. Comparative blood-determined biomaterials incorporate FS (likewise called fibrin stick), PG, platelet fibrin stick.

**Illuminated blood items**

The regular blood items that are illuminated are: PRBC, platelets and granulocyte concentrates. Illumination is vital and compulsory in following conditions:

- Gamma radiation of cell blood parts is to forestall bonding related unite versus have disease[16]
- E.g. Immunosuppressed or traded off patients yet not in patients with Helps, all youngster trade bondings, intrauterine bondings, all gifts from first or second-degree family members and all HLA-chose parts.
- For aplastic sickliness patients getting immunosuppressive treatment with hostile to thymocyte globulin. Platelets can be lighted at any stage while capacity and time span of usability stays same
- All granulocyte segments ought to be illuminated before issue and bonded with least delay.[17] The base portion accomplished in the lighted unit ought to be 25 Gy, with no aspect of the unit getting in excess of 50 Gy.[16]

**Stuffed red platelet or platelet concentrate, saline washed**

Saline washed red cells are a specific part arranged uniquely on interest for patients with antibodies to plasma protein (e.g., hostile to IgA) and the individuals who have extreme unfavorably susceptible responses when bonded with blood products.[11] This a less expensive technique than both Leuco and Plasma exhaustion. The equivalent can be set up from PRBC after Leuco decrease or BC evacuation. The saline washing is done threefold or multiple times either by manual or computerized techniques. The last item ought to be PRBC suspended in saline with <0.5 g protein per unit. A similar standard of washing PLTC holds useful for the treatment of neonatal alloimmune thrombocytopenia.[11]

**Photopheresis**

Photopheresis is another variety of apheresis where the white cell part is presented to bright radiation ex vivo. In this strategy, a photoactive color, for example, psoralen (8-methoxypsoralen or 8 MOP) is taken by mouth. A few hours

after the fact, the apheresis method is performed. Ex vivo, the isolated white cell segment is presented to bright radiation causing drug actuation. The main unmistakably acknowledged sign for photopheresis is in the treatment of cutaneous White blood cell lymphoma where sensational abatements in skin sores are frequently observed.[18]

**Microorganism inactivation**

Decrease of microorganisms is normally accomplished for plasma and plasma fractionation items. The Ethanol utilized in cool liquor fractionation is without anyone else a successful virucidal and antimicrobial specialist.

**Extra Cycles**

- Heat-Sanitization, dry warmth in the last holder, steam treatment of dry item within the sight of steam under tension
- Chemical-Treatment of FFP with methylene blue (MBFFP) or dissolvable cleanser (SDFFP)
- Low pH 5 (low-pH) treatment ( $\pm$ pH 4.0) with or without pepsin 6 is utilized in the viral inactivation of immunoglobulin arrangements
- Beta propiolactone therapy followed by UV illumination.

Filtration utilizing channels of proper pore size (nanofiltration) eliminates infections with a protein film however not those with a lipid envelope. Aseptic layer filtration (0.22  $\mu$ m) is utilized to eliminate miniature creatures and clean mass items preceding filling ampoules/last item containers.[1,19]

Different specialists utilized for microorganism inactivation for platelets and plasma are Psoralen or Riboflavin with bright light treatment. Microorganism inactivation of parts containing red platelets presents a difficult situation. In such circumstances, S303 (Helinx), a little particle intended for microbe inactivation is in effect effectively tried.[20]

**Blood substitutes**

Enormous number of medications are being utilized as blood substitutes like hemoglobin arrangements, haemostatic specialists and plasma expanders. As of late, progress in culture procedures and evidence of rule concentrates in creature models have permitted proposing red platelets produced in culture (cRBCs) as a potential novel blood substitutes.[21]

**Capacity and Lapse**

Entire blood is gathered right now in compartments fabricated from polyolefin or polyvinyl chloride (PVC) that is more slender or plasticized with various mixes, for example, triethyl hexyl trimellitate and butyryl-tri-hexyl citrate. These packs give almost double the oxygen penetrability of original Di ethyl hexyl phthalate plasticized PVC holders and furthermore keep up pH more than 6 for better platelet endurance and function.[22] The requirement for legitimate segment stockpiling is to save the natural capacity of the constituents, decline their metabolic exercises, and decrease bacterial development of the blood segments.

According to standard guidelines[22] the capacity temperature for red cells is somewhere in the range of +2°C

and +6°C, for Platelets and leucocytes-somewhere in the range of +20°C and +24°C and for plasma items, underneath -18°C.

All segments are to be put away in three compartments or supplies, the Untested parts, the Tried and safe to be given segments and the Tried hazardous or isolated segments for discarding.[23]

Furthermore discrete hardware is required for being careful cross-coordinated units if accessible. During the vehicle, the parts can be put away for a limit of 24 h whenever kept up at proposed temperatures. PRBC must be kept up between +2°C to +10°C. All parts are regularly put away somewhere in the range of +20°C and +24°C and furthermore sent at same temperatures. All solidified parts ought to be moved in a way to keep up their solidified state.

The temperature changes can be observed and archived either through pointers fixed on units or checking every segment physically for any disintegration. The virus chain upkeep for all blood parts ought to reach out to the point of transfusion.[24]

The capacity and transport supplies utilized are: Fridges (+4 ± 2°C): For capacity of entire blood and PRBC and for capacity of defrosted FFP and other plasma items, Platelet hatchery instigators (+22 ± 2°C) with tumult speed at 60 cycles for every moment For capacity of all sort of platelet items, Profound coolers (-80°C): For freezing FFP or solidified blood constituents. Fast freezing can be accomplished by Mechanical impact coolers and capacity of solidified PRBC or Platelets beneath -65°C or significantly colder, Coolers (-40°C): Stockpiling of all plasma items underneath -30°C or considerably colder and Transport boxes: Transport boxes are utilized for transportation of blood or blood segments for a brief span between two stockpiling destinations. Indeed, even blood mobiles have inherent virus chain stockpiling gadgets with reinforcement power. The subtleties of the capacity necessities are enrolled in Tables Tables22- - 55.[24] 'The choice to bond ought to be gone before via cautious assessment of the clinical state of every individual patient and not be founded only on research facility results. Bonding medication in an emergency clinic setting is chiefly engaged to guarantee that 'the correct blood is given to the correct patient in the perfect time and at the perfect place'.[25]

**Table 2:** Capacity and termination prerequisites of RBC parts

Component	Storage	Expiration
PRBC-component, apheresis and leucodepleted	4±2°C	CPDA-1: 35 days AS: 42 days Open system: 24 h
RBCs irradiated		Original expiration or 28 days from date of irradiation, whichever earlier To avoid hyperkalemia in neonates-24 h
Saline washed		24 h
Frozen RBCs 40% glycerol or 20% glycerol	≤-65°C if 40% glycerol; ≤-120°C if 20% glycerol	10 years
Deglycerolized RBCs	4±2°C	Open system: 24 h Closed system: 14 days
Rejuvenated RBCs		CPDA-1: 24 h AS-1: freeze after rejuvenation at ≤42 days
Washed rejuvenated RBCs and deglycerolized rejuvenated RBCs		24 h
Frozen rejuvenated RBC	≤-65°C	10 years AS-1: 3 years

AS – Additive solution; RBC – Red blood cell; PRBC – Packed red blood cell concentrate; CPDA – Citrate phosphate dextrose adenine

**Table 3:** Capacity and termination prerequisites of platelet parts

Component	Storage	Expiration
Platelets	20-24°C with continuous gentle agitation	24 h to 5 days depending on collection system
Platelets irradiated		Open system: 4 h Closed system: No change in expiration date
Platelets leucocytes reduced		Open system: 4 h Closed system: Expiration date should be earliest expiration date in pool
Pooled platelets (open or closed system)		Open system: 4 h Closed system: 4 h after pooling or 5 days following collection using an approved FDA system
Pooled platelets leucocytes reduced		24 h to 5 days depending on collection system No change from original expiration date
Apheresis platelets		Open system: 4 h Closed system: 5 days or 7 days if in an approved FDA-monitored program
Apheresis platelets irradiated		
Apheresis platelets leucocytes reduced		

FDA – Food and drug administration

**Table 4:** Capacity and termination prerequisites of granulocyte parts

Component	Storage	Expiration
Apheresis granulocytes	20-24°C without agitation	24 h
Apheresis granulocytes irradiated		

**Table 5:** Capacity and termination prerequisites of plasma

Component	Storage	Expiration
FFP	≤-18°C	12 months
Plasma frozen within 24 h after phlebotomy		
Apheresis FFP		
Cryoprecipitated AHF		
Liquid plasma	4±2°C	5 days after expiration of RBCs
Thawed	20-24 C	Open system or pooled: 4 h
cryoprecipitated AHF		Single unit: 6 h
Cryoprecipitate reduced plasma (after thawing)	4±2°C	5 days
FFP (after thawing)	4±2°C	For coagulation 6 h or others 24 h

FFP – Fresh frozen plasma; AHF – Antihemophilic factor

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