ALBERTA PRECISION LABORATORIES
Leaders in Laboratory Medicine

Plasma

APPLICABILITY: This document applies to APL, AHS, Covenant Health, and all other health care professionals involved in the transfusion of blood components and products in Alberta.	***OTHER NAMES:*** *Fresh Frozen Plasma (FFP), Frozen Plasma (FP)* ***Company:*** *Canadian Blood Services (CBS)* ***Class:*** *Human blood component, derived from whole blood*

	INTRAVENOUS			OTHER		
ROUTES	**DIRECT IV**	**Intermittent Infusion**	**Continuous Infusion**	**SC**	**IM**	**OTHER**
Acceptable Routes*	No	Yes	No	No	No	N/A

*** Professionals performing these restricted activities have received authorization from their regulatory college and have the knowledge and skill to perform the skill competently.**

DESCRIPTION:

- Plasma is available as Frozen Plasma (FP) and Apheresis Fresh Frozen Plasma (AFFP).
- Plasma is prepared from anticoagulated whole blood from volunteer donors, centrifuged, separated, and leukocyte reduced by filtration.
- FP is prepared from whole blood is collected in CPD that is separated into its components using the buffy coat preparation method and frozen within 24 hours of collection. AFFP is collected by apheresis in sodium citrate or ACD-A anticoagulant and frozen within 8 hours of collection.
- FP and AFFP contain non-labile coagulation factors at similar levels. The levels of labile clotting factors V and VIII may be slightly reduced in FP compared to AFFP. This difference is not clinically significant therefore AFFP and FP are used interchangeably.
- FP is available in approximately 283 mL bags, and AFFP is available in approximately 249mL or 494 mL bags.
- Donors are screened and blood donations are tested for, at minimum:
  - ABO and Rh types
  - Clinically significant antibodies against red cell antigens
  - Antibodies to human immunodeficiency virus (HIV-1 and HIV-2),
  - Hepatitis C virus (HCV), human T-cell lymphotropic virus type I and II (HTLV-I/II), hepatitis B core antigen (HBcore)
  - Hepatitis B Surface Antigen (HBsAg)
  - Presence of viral RNA (HIV-1 and HCV) and viral DNA (hepatitis B virus (HBV))
  - Syphilis
- Stored in a di-ethyl hexyl phthalate (DEHP) plasticized bag.
- Not guaranteed to be latex-free.

PRETRANSFUSION TESTING & COMPATIBILITY:

PRETRANSFUSION TESTING:

- A pretransfusion ABORH is required for the provision of plasma and must be performed unless delaying plasma transfusion would be life-threatening.
- The ABORH may be ordered independently, or as part of a Type and Screen.

COMPATIBILITY:

- ABO compatible plasma may not be ABO identical with the patient. See the *ABORH Compatibility Chart.*
- Rh is not a factor in plasma transfusion.
- In emergencies, when the pretransfusion ABORH is not complete, group AB plasma will be provided for all patients.

AVAILABILITY:

- Supplied by Canadian Blood Services.
- Contact your local laboratory/transfusion service regarding stock availability on site.
- Plasma is stored frozen, and as a result requires preparation time prior to issuing.
- Patient blood type should be determined when possible to allow for ABO specific/compatible plasma transfusion and preservation of AB plasma inventory for emergency situations when the ABO group is unknown.

INDICATIONS:

- Treatment or prevention of clinically significant bleeding due to a deficiency of one or more plasma coagulation factors, for which more appropriate or specific alternative therapy is not available.
- Patients who are bleeding or undergoing invasive procedures who require replacement of multiple plasma coagulation factors.
- Patients with massive hemorrhage with clinically significant coagulation abnormalities.
- Patients with Thrombotic Thrombocytopenic Purpura (TTP), Hemolytic Uremic Syndrome (HUS), or other conditions treated by therapeutic plasma exchange where the exchange fluid must contain coagulation factors.
- Preparation of reconstituted whole blood for neonatal exchange transfusion.

CONTRAINDICATIONS:

- Plasma transfusion is not indicated for:
  - Conditions where non-transfusion therapies or observation would be just as effective.
  - Volume replacement.
  - Correction of factor deficiencies where a specific factor concentrate is available.
  - Correction of a mildly elevated INR (<1.8) or aPTT before a procedure.
  - Conditions that require von Willebrand Factor supplementation.
  - Assisting with wound healing.

WARNINGS:

- Plasma must be ABO compatible.
- Patients with undetectable levels of IgA, antibodies against IgA, and a history of transfusion reactions should receive plasma from IgA deficient donors.
- Patients with known anaphylaxis to plasma components should only receive plasma under appropriate medical supervision.

DOSE:

- Dose is to be determined by the most responsible health practitioner (MRHP).
- Volume transfused will depend on the clinical situation and patient size.
- The dose to achieve a minimum of 30% of plasma clotting factor concentration is attained with a dose of 10-15mL/kg.
- Plasma units may be split into multiple smaller volume bags to facilitate small doses and reduced donor exposure. Contact your local laboratory/transfusion service regarding availability of split units.

ADMINISTRATION:

Administer per the AHS *Transfusion of Blood Components and Blood Products Policy.*

In non-urgent/non-bleeding/inpatient settings, blood components should be transfused during daytime hours (for patient safety) and transfused one unit at a time**.**

Confirm written (signed) consent has been obtained and documented prior to requesting blood component from lab/transfusion service where possible. *Refer to the AHS Consent to Treatment/Procedure(s) Policy Suite.*

Pre-Infusion:

- Ensure recent patient weight and height is on file
- Ensure pertinent labs are available as required (i.e. ABORH, INR)
- Ensure any ordered pre-medications have been given (antihistamines, antipyretics prn).
- Perform pre-transfusion checks per AHS Transfusion Policy and Procedure
- Report any new onset acute illness to the authorized prescriber prior to commencing infusion.
- Perform a visual inspection of the unit. Refer to the *CBS Visual Assessment Guide.*

Access:

- Plasma can be given via CVAD, peripheral venous line, intraosseous device, or umbilical venous catheter.
- Use an IV catheter suitable for the size of vein and purpose of transfusion.

Equipment:

- Administer through a standard blood transfusion set (170 – 260 micron filter)
- Air eliminating micron filters are not compatible with plasma transfusions.
- Change set as needed, but at minimum every 8 hours or per manufacturer's recommendation
- Plasma may be infused using a blood warmer, pressure infusion device, or syringe pump as ordered by the authorized prescriber or as defined by an approved protocol.
- Rapid infusers and other pressure infusion devices must not exceed 300mmHg.

ADMINISTRATION cont'd:

Compatible IV Solutions:

- Compatible with 0.9% Sodium Chloride (Normal Saline)
- Blood components should be administered one unit at a time, however if required, co-administration of platelets, red cells, or 5% albumin may be performed at the discretion of the MRHP.
- Do not mix with other products, medications, or solutions.

Other Solutions:

- Studies in Alberta have shown other IV solutions to be compatible with citrated blood components. *
- These solutions should only be considered in situations where the use of 0.9% Sodium Chloride would lead to undesirable metabolic abnormalities.
- Only isotonic, calcium-free IV solutions should come in contact with blood products. Calcium may bind with the citrate anticoagulant and promote clotting in the tubing. Excess glucose and/or dextrose causes hemolysis and shortens red cell survival.
- Solutions meeting these criteria include:
  - Plasma-Lyte A®: Contains Sodium 140mEq/L, Potassium 5mEq/L, Magnesium 3mEq/L and Chloride 98mEq/L at pH 4.0.
  - Other isotonic, calcium and glucose/dextrose free commercial electrolyte solutions (i.e. Normosol®-R)
  - Ringer's Lactate (LR). **Note:** Studies have shown LR to be compatible with citrated blood components. However, additional studies around the safe use of LR as a citrated blood component diluent are needed.

***** This information differs the Canadian Blood Services circular of information. As studies in Alberta have shown compatibility with the listed IV solutions, their inclusion within this document is in compliance with CSA Standards.

Medications:

- Medications **must not** be added to the blood component bag.
- If it is necessary to administer medications simultaneously with blood components, it is safest to use an alternate site for the medication.
- If administration using a separate site is not possible:
  - Pause the blood component transfusion and flush the IV line with 0.9% Sodium Chloride.
  - Administer the medication.
  - Flush the IV line again with 0.9% Sodium Chloride before resuming the transfusion.

Infusion Rate:

- Administration rate should be specified by the MRHP after patient assessment.
- Infusion rate depends on the patient's blood volume, cardiac status and hemodynamic condition.
- **Recommended rates for routine transfusion:**

Patient Weight	Infusion Rate: For the First 15 Minutes	Infusion Rate: After the First 15 Minutes
Greater than 25 kg	50 millilitres per hour (mL/h), if possible	For all patient weights: Continue transfusion at the prescribed rate as per the authorized prescriber's order, as long as it does not exceed four (4) hours from the time of blood component removal from the approved storage device / location
Less than or equal to 25 kg	1 millilitres per kilogram per hour (mL/kg/h) or slower for the first 15 minutes, if possible	

POTENTIAL HAZARDS WITH PARENTERAL ADMINISTRATION:

- Potential adverse events related to a blood product transfusion range in severity from minor with no sequelae to life-threatening.
- All adverse events occurring during a transfusion should be evaluated to determine whether or not the transfusion can be safely continued/restarted.
- All adverse events suspected to be related to a product transfusion (whether during or after a transfusion) must be reported to your local transfusion service.
- The most common reactions to plasma are mild allergic reactions and transfusion associated circulatory overload (TACO). Refer to the *Acute Transfusion Reaction Chart* for symptoms indicative of transfusion reaction.

NURSING IMPLICATIONS:

Patient Vital Signs and Monitoring:

	Pre Transfusion Vitals?	Stay At Patient Bedside?			Vital Signs During Transfusion		Post Transfusion Monitoring
		First 5 min	First 10 min	First 15 min	After 15 min	Remainder of transfusion	
All Patients	**Yes**	**Yes**	**NO**, but must be immediately available*		**Yes**	**q1h**	Set of vital signs Monitor for minimum of 15 minutes post transfusion **

*Defined as performing non-dedicated tasks with the patient in view.
**If patient has had a previous adverse reaction to component transfusion, or this is the first time the patient is receiving that component type, monitor for 30 to 60 minutes.

Note: Vital signs/patient monitoring may be conducted more frequently, or continuously, as determined by clinical condition of patient.

Patients receiving blood product transfusions must be observed closely for signs of any unexpected or untoward reactions. These reactions may occur during or after the infusion of blood or blood products. For follow up instructions to a transfusion reaction, go to http://www.albertahealthservices.ca/lab/page4240.aspx

Documentation:

- Ensure documentation is completed per the *AHS Transfusion of Blood Components and Blood Products Policy.*
- Patient tolerability should be documented in appropriate flow chart or clinical record (electronic or paper).
- Document vital signs as required in the appropriate flow chart or clinical record (electronic or paper).
- Provide patient notification documentation where required.

STORAGE & STABILITY:

- Plasma is stored at -18°C until expiry (up to 12 months from the date of collection).
- Thawed plasma is stored at 1-6°C and has a limited shelf life (varies by plasma product).
- Do not refreeze thawed plasma.
- Do not use expired product.

CONTACT INFORMATION:

Approved By: APL Transfusion Medicine Discipline Council
For questions or comments please contact: Transfusion.SafetyTeam@aplabs.ca

REFERENCES

Canadian Blood Services Circular of Information for the Use of Human Blood Components. Plasma Components. Available from www.blood.ca

Visual Assessment Guide. Canadian Blood Services. January 2009. Available from https://professionaleducation.blood.ca/

CBS Clinical Guide to Transfusion. Available from https://professionaleducation.blood.ca/

Ten Things Physicians and Patients Should Question. Canadian Society for Transfusion Medicine. Available from choosingwiselycanada.org

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Transfusion of Blood Components and Blood Products. AHS Policy PS-59.