ALBERTA PRECISION LABORATORIES
Leaders in Laboratory Medicine

Plasma

APPLICABILITY: This document applies to AHS, Covenant Health, and all other health care professionals involved in the transfusion of blood components and products in Alberta.	***OTHER NAMES:*** *Apheresis Frozen Plasma (AFP), Frozen Plasma (FP), Solvent Detergent (SD) Plasma (Octaplasma™)* ***Company:*** *Canadian Blood Services, Octapharma* ***Class:*** *Human blood component, Derived from whole blood*

ROUTES	Intravenous	Subcutaneous	Intramuscular	Intraosseous
Acceptable Routes*	Yes	No	No	Yes

* Administration of blood components and blood products is a restricted activity. For specific conditions that apply to a profession's authorization to administer blood components and blood products, consult the applicable discipline-specific regulation under the Health Professions Act (Alberta). Health care professionals with this authorization require the applicable education, training and competency.

DESCRIPTION:

- Plasma is available as Frozen Plasma (FP) Apheresis Frozen Plasma (AFP), and Solvent Detergent (SD) Plasma.
- Plasma is prepared from anticoagulated whole blood from volunteer donors, centrifuged, separated, and leukocyte reduced by filtration.
- FP, AFP, and SD Plasma contain non-labile coagulation factors at similar levels.
- Solvent Detergent (S/D) is treated to destroy enveloped viruses. Solvent detergent treatment is not effective against non-enveloped viruses.

Details	Frozen Plasma (FP)	Apheresis Frozen Plasma (AFP)	Solvent detergent Plasma (SD)
Collection	Whole blood collected in CPD, then separated in components using the buffy coat preparation method. Frozen within 24 hours.	Apheresis in sodium citrate or ACD-A anticoagulant. Frozen within 8 hours of collection.	Pooled plasma
Donor Screening	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		
Available size(s)	280mL (approximate) *Note: FP and AFP units may be split into multiple smaller volume bags to facilitate small doses and reduce donor exposure. Contact your local laboratory/Transfusion service regarding availability of split units*	250mL (approximate)	200mL
Storage bag information	di-ethyl hexyl phthalate (DEHP) plasticized bag		Sterile, plasticized polyvinyl chloride (PVC) bag
Latex	Not guaranteed to be latex-free		

PRETRANSFUSION TESTING & COMPATIBILITY:

- 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 ABO compatibility chart at: ABORH Compatibility Chart.
- Rh is not a factor in plasma transfusion.
- In emergencies, when the pretransfusion ABORH is not complete, group AB plasma or Low Titre group A will be provided.

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.

Details	Frozen Plasma (FP)/Apheresis Frozen plasma AFP	Solvent Detergent Plasma (SD)
Minimum thaw times	20 minutes	30 minutes (minimum)

- Patient blood type should be determined, when possible, to allow for ABO specific/compatible plasma transfusion and preservation of AB plasma or Low Titre group A inventory for emergency situations when the ABO group is unknown.

INDICATIONS FOR USE:

- 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.

Plasma Screening

- APL Transfusion Medicine (TM) screens orders for plasma for adult patients based on the criteria in the table below.
- Orders that fall outside these recommendations will require approval from a TM Physician.

For Stable, Non-Bleeding Patients who are not undergoing therapeutic plasma exchange

- Applies to Inpatients and Emergency Department Patients
- INR must have been done in the last 24 hours.

If…	Then…
No INR within 24 hours	Draw INR
INR is less than 1.8	• Request is outside of recommendations • Contact TM Physician for approval
Indication is for warfarin (coumadin) or DOAC reversal	Plasma is not indicated
Patient-specific request based on diagnosis or long-term treatment plan	Contact TM Physician

Don't Misuse My Blood Project
DMMB Clinical Decision Support Tools (albertahealthservices.ca)

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.
- Patients with severe deficiency of protein S. S/D Plasma has significantly lower levels of protein S as compared to FP, which may result in an increased risk of blood clots. If these patients with severe deficiencies of protein S require a plasma transfusion, they should receive FP.

DOSE:

Dose is to be determined by the most responsible health practitioner (MRHP) and depends on the clinical situation and underlying disorder.

- 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. This is the ideal way to dose adults as well as pediatric and neonatal patients.

ADMINISTRATION:

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

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**.**

Transfusion of each unit must be completed within 4 hours of removal from a cold storage device approved by the Transfusion Service.

Confirm signed consent has been obtained and documented prior to requesting blood components or products (human-source) 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 premedication have been given (antihistamines, antipyretics prn).
- Perform pre-transfusion checks per AHS Transfusion of Blood Components and Blood Products Policy PS-59.
- 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 Inspection Tool.

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.
- A pull/push device or 3-way-stopcock system or custom neonatal transfusion set is acceptable for delivering partial aliquots. Blood component aliquots must be filtered (as above) and should not stand in the syringe.
- 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.

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.

Other Solutions

- Do not mix with other products, medications, or 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 7.4.
  - Other isotonic, calcium and glucose/dextrose free commercial electrolyte solutions (i.e., Normosol®-R)
  - Ringer's Lactate/Lactated Ringer's (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 or infusion line for the medication.

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 millilitre per kilogram per hour (mL/kg/h)* or slower for the first 15 minutes, if possible	

* Program pump as 0.25mL/ kg (millilitre per kilogram) 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 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 Acute Transfusion Reaction Chart.
- Complications of massive and/or rapid transfusions may include hypothermia, citrate toxicity and acidosis.

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 Transfusion Reactions | Alberta Health Services

Documentation:

- Ensure documentation is completed per the *AHS Transfusion of Blood Components and 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:

Storage Details	Frozen Plasma (FP)/ Apheresis Frozen Plasma (AFP)	Solvent detergent Plasma (SD)
Frozen (-18°C)	12 months	48 months
Thawed	5 days (1-6°C)	5 days (at 2-8°C)
Additional details	• Do not refreeze thawed plasma. • Do not use expired product. • Protect from exposure to light. • Do not use solutions that are cloudy or have deposits.	

CONTACT INFORMATION:

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

REFERENCES

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Canadian Blood Services. FAQ: solvent detergent (SD) treated plasma (octaplasma). February 2, 2023.

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Ten Things Physicians and Patients Should Question. Canadian Society for Transfusion Medicine. Available from Transfusion Medicine - Choosing Wisely Canada

CSA. Blood and Blood Components. National Standard of Canada. CAN/CSA-Z902:20. Ottawa, ON. Standards Council of Canada; 2020.

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

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NAC recommendations solvent detergent plasma (SD plasma), National Advisory Committee on Blood and Blood Products, Guidelines and Recommendations, March 13, 2023.