INFECTION PREVENTION AND CONTROL CONSIDERATIONS FOR RETURN OF BLOOD COMPONENTS AND PRODUCTS TO INVENTORY

NAC INFECTION PREVENTION AND CONTROL STATEMENT

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ABBREVIATIONS

IPC	Infection Prevention and Control
PPRP	Plasma Protein and Related Product
TM	Transfusion Medicine
TML	Transfusion Medicine Laboratory

SUMMARY OF REVISIONS

2025	
General	Title, author information, table of contents, abbreviations and summary of revision pages added. Updates made to ensure consistent language is used throughout. Document restructured to encompass best practice, general considerations and transfusion medicine policy in separate sections.
Section 4.0	Transfusion Medicine Policy Considerations added to provide practical infection prevention and control guidance for the transfusion medicine laboratory.
References	References section added.

1.0 INTRODUCTION

Ongoing concerns have been raised about the possibility of the external surfaces of blood components, plasma protein and related products (PPRPs), and the containers in which they are transported, as potential vectors of infectious diseases. To mitigate the potential for spread of infection, appropriate measures must be taken when handling blood components and PPRPs to ensure the potential for their return into inventory as a means of preserving supply. **This document was created to share infection prevention and control (IPC) options in patient care and transfusion medicine laboratory (TML) environments and includes suggestions from various health jurisdictions as well as Canadian Blood Services.** Determining the application of these options within institutions and/or in the context of specific outbreaks is beyond the scope of this document.

2.0 GENERAL CONSIDERATIONS

Routine IPC practices should be followed as outlined by health authority policies. **Staff must be familiar with related institutional policies and procedures to inform protocols for managing blood component and PPRP issues from and return to the TML.** Notification of patient isolation or infectious disease outbreaks on specific wards may not always occur; therefore, a consistent process in either the issuing or handling of returned blood components and PPRPs is required. If not already in place, policies should be developed to manage the return of inventory issued in the setting of both routine and emergency need for transfusion.

The effectiveness of disease specific decontamination procedures may be difficult to establish or validate due to the numerous biologic (infectious agent, mode of transmission, surface viability) and environmental (temperature, surface material, chemical) factors which must be considered. Institutional IPC teams and/or medical microbiologists should be consulted as part of any policy creation to ensure consistency across the health care system.

3.0 BEST PRACTICE CONSIDERATIONS

- Personal protective equipment policies should be followed while handling blood components and PPRPs;
- Hand hygiene should be performed after doffing gloves and when hands are visibly soiled;
- It is recommended for health authorities (or jurisdictional equivalent) to utilize local IPC teams to develop and/or update protocols and procedures;
- Blood components and PPRPs should not be requested from the transfusion medicine laboratory unless the following have been confirmed by the bedside care staff:
  - The order for transfusion is present on the chart; and,
  - Consent to receive transfusion has been verified; and,
  - Venous access is available and patent (if applicable).
- Only a single unit should be taken into the patient's room at the time, and only immediately prior to transfusion administration;

- In the event of a transfusion reaction when return of blood components or PPRPs is required, the component bag or bottle should be clamped with the attached blood tubing and flush solution, with the end of the tubing capped to prevent leaking and placed in a clean plastic bag prior to delivery to the transfusion medicine laboratory;
- Transport containers:
  - Pneumatic tube system carriers and associated materials should never enter the patient's room;
  - Coolers/transport containers containing blood components should:
    - Remain in the anteroom or outside of the patient care room or operating theatre, with the exception urgent/emergent transfusion need.
      - If required within the patient room, the container should be left in a "clean area" at least 2 meters away from the patient with the lid closed.
    - Only be opened to remove units at the time of transfusion need (blood components and PPRPs should never be "pre-checked" and returned to the cooler).
  - Pneumatic tube carriers, coolers and other transport containers should be placed in a separate "dirty area" upon return to the transfusion medicine laboratory until the external and internal surfaces of the cooler have been cleaned and disinfected. This should be performed with a low-level disinfectant in accordance with local protocol to permit return to use.[1]
    - For containers that have an exterior surface other than hard plastic, consultation with the container manufacturer may be necessary to confirm external decontamination options.

4.0 TRANSFUSION MEDICINE POLICY CONSIDERATIONS

Three general policy directions may be considered when establishing your hospital transfusion medicine (TM) practice for the return of blood components and PPRPs to inventory.

Not all patients who may have communicable disease or may be colonized with antibiotic-resistant organism are readily identifiable. **The National Advisory Committee on Blood and Blood Products recommends that routine practices should be geared towards all patients, as infections may not be apparent at the time.** Consultation with local IPC experts is recommended to determine which approach is more appropriate for your hospital circumstances.

As described below, a blend of the following policies may be optimal for situations that do not align with the adoption of a singular process.

4.1 Policy Consideration A: Universal Precautions when Issuing

This policy contemplates universal application of a preventative protocol for all blood components and PPRPs at the time of issue from the TML. Through this process, the requirements to cleanse blood components or PPRPs returned to the TML is avoided unless unique circumstances arise.

Issuing Blood Components and PPRPs

When issuing to a ward, all blood components and PPRPs must be over-wrapped in a bag or placed in a hospital approved blood transport container with a tamper-proof seal. Examples include:

- A plastic bag, box or container with a cable tie/zip or locking mechanism;
- A zip-lock bag with a cable tie/zip tie or staple placed through a punched hole near the zipper; and,
- Use of coloured tamper-tape to seal the twisted end of a plastic bag or over the edge of a zip-lock seal/closure.

Considerations should be made regarding the limit of blood components or PPRPs within each bag, as to not cause challenges for partial returns or create undue potential waste. There are theoretical concerns regarding the lack of certainty regarding the impact of plastic overwrap on gas exchange for cellular components. Thus, plastic overwrapping may be suitable only for PPRPs and acellular components (Plasma & Cryoprecipitate), but local policy and practice may be variable.

Returned Blood Components and PPRPs

When returned, blood components and PPRPs that have met all other criteria for return to inventory and are in an over-wrapped, sealed bag, box or container should have their external surface wiped clean before being placed on any clean surface within the TML. When opened, the contents gently emptied onto a clean surface within the TML. Any disposable over-wrapping should be immediately discarded and gloves doffed. Non-disposable containers should be set aside for cleaning.

In the event that a blood component or PPRP is returned to the TML unsealed, or in situations where over-wrapping and sealing cannot be performed, refer to the processes as outlined in sections 4.2 and 4.3 below.

4.2 Policy Consideration B: Cleansing of Units or Vials Upon Return

This process is enacted only upon the return of blood components and eliminates the need for routine use of sealed containers or over-wrapping during issue. This may not apply in scenarios where the cleansing process would damage the unit container and/or PPRP packaging, where Policy Consideration C for those specific scenarios may be more appropriate. For cleansing of units, there are two options that may be considered.

Option 1: Universal Cleansing of Blood Components Upon Return to the TML

The external surface of blood component bags should be cleaned as recommended by manufacturer guidelines before being returned to inventory:

- Canadian Blood Services most commonly recommends cleaning with 70% isopropyl alcohol wipes and rinsing with water before drying with a paper towel. 70/30 isopropyl alcohol and water is interchangeable with 70% isopropyl alcohol wipes.[2]
- Alternative disinfectant wipes have been studied for use on the surface of red blood cell units.[3]

This cleansing process is also recommended for sites with an over-wrapping or transport container policy, in instances when blood components have been returned unsealed.

Option 2: Selective Cleansing of Blood Components Upon Return to the TML

Cleansing of blood components occurs only when there is an outbreak on the ward, or the patient is on IPC precautions and the blood component or PPRP has entered the patient's room.

This option requires a procedure for contacting the ward to ascertain the answers to the following questions or a procedure for the ward to proactively notify the TML:

- If the returned blood component or PPRP meets all criteria for return to inventory, contact the ward to determine if there is an outbreak on the ward, if the patient is on IPC precautions and if the blood component or PPRP entered the patient's room:
  - If the answer is **NO**, routine procedures may be followed for return of the blood component or PPRP to inventory;
  - If the answer is **YES**,
    - Follow the aforementioned procedure for cleansing blood components; or,
    - Consider discard or quarantine for PPRPs returned in cardboard packaging that is not amenable for cleaning.

4.3 Policy Consideration C: Discard or Quarantine

This policy may be considered for circumstances where neither of the aforementioned policy considerations (A or B) are deemed acceptable for the circumstance. For example, policy option B is preferred; however, the cleansing process would result in damage to the unit container and/or PPRP packaging.

- The blood component or PPRP may be discarded in accordance with usual biological agent disposal protocol; or,
- The blood component or PPRP may be placed in a dedicated quarantine environment for a predefined timeline dependent on the infectious agent and its viability on a plastic, glass or cardboard surface within the specified storage environment.
  - Blood components and PPRPs must be viable long enough to allow for an appropriate quarantine period.
  - This may require consultation with local IPC experts to understand the viability of pathogens on the relevant surface and determination of an appropriate quarantine period.
  - PPRP overwrapping and/or sealed containers may obviate the need for discard or quarantine.

4.4 A Blend of Policies A, B and C

This approach may prove to be the optimal solution in light of concerns regarding the impact of plastic overwrap on gas exchange for cellular blood components and the inability to properly cleanse PPRP packaging upon return.

This approach contemplates separate processes for blood components and PPRPs:

- Universal cleansing (policy B) upon return for blood components to avoid concerns regarding the impact of plastic overwrap on gas exchange for cellular blood components; and,
- Universal prevention using plastic overwrap or a transport container (policy A) for PPRPs to avoid damage to packaging by cleaning agents upon return. If the PPRP is returned without the plastic overwrap or transport container used for universal prevention, then default to discard or quarantine (Policy C).

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