

Introduction

The **Manitoba Transfusion Best Practice Resource Manual (MTBPRM)** has been developed and maintained by the **Provincial Nurses Working Group for Transfusion Practice**. This is the third version of the original **Manitoba Transfusion Medicine Best Practice Resource Manual for Nursing**. The purpose of this ongoing work is to have consistently current, standardized and evidenced based resources for all health care providers involved in the administration of blood, blood products, and plasma protein products. The MTBPRM is available in both printed and electronic formats found on Best Blood Manitoba website.

1. The Blood System in Canada and Manitoba

The current blood system in Canada came into being in 1998 when Canadian Blood Services (CBS) and Hema Quebec (HQ) were formed on the recommendation of Justice Horace Krever.

Throughout the 1970's and 1980's many recipients of blood or blood products developed communicable diseases like Hepatitis C and Human Immunodeficiency Virus (HIV). It is estimated that 30,000 Canadians contracted Hepatitis C and 2,000 Canadians contracted HIV from contaminated blood or blood products.

In 1993, following release of the report *Tragedy and Challenge: Canada's Blood system and HIV*, Canadian Ministers for Health, federal, provincial other than Quebec and territorial, agreed that an inquiry into the blood system in Canada be undertaken.

This inquiry came to be known as the **Krever Commission**. Justice Horace Krever was mandated to "review and report on the mandate, organization, management, operations, financing, and regulation of all activities of the blood system in Canada, including the events surrounding the contamination of the blood system in Canada in the early 1980's." This review began in 1993 and was completed in 1997; the 1200 page report includes detailed history and fifty recommendations in five categories: Compensation, the Canadian Blood Supply System: Basic Principles, The Operator: A National Blood Service, The Regulator: The Health Protection Branch and Public Health.

Recommendation numbers 3-28, addressed the overhaul of Canada's blood system resulting in the creation of Canadian Blood Services and Hema Quebec in 1998.

Canadian Blood Services provides blood and blood products as a vendor regulated by Health Canada. They perform the collection, testing and processing of blood into components and other blood products. Standard testing in Canada includes ABO and Rh blood groups, antibody screen, Human Immunodeficiency Virus (1 & 1), Hepatitis B and C viruses, Human T Cell Lymph tropic virus (I & II) and Syphilis . CBS also tests for West Nile Virus and Chagas Disease when increased risk is present and performs extended red blood cell phenotyping as needed.

In Canada blood products are a national resource and are moved between cities and provinces as needed to ensure national supply. CBS and HQ serve each other in times of shortages Manitoba contributes 4% of the collected blood in Canada.

Hospital Blood Banks are governed and operated by Shared Health, previously Diagnostic Services of Manitoba (DSM). The primary purpose of blood banks is to distribute blood products to the transfusion sites; in addition they perform an important role in the investigation of transfusion reactions and follow up.

Transfusion sites include health care facilities and professionals, who order, transfuse, monitor, and evaluate the use of blood and blood products. Their monitoring and recognition of transfusion reactions is integral to the safety of the whole blood supply. When a reaction is reported, the donor or donors that contributed to the product the patient received can be identified as part of the vein to vein tracking.

Transfusion Practice Committees (TPCs) are formed and function as oversight in the safe administration of blood and blood products. This was one of the recommendations made in the Krever Report. There are currently seven active TPCs in Manitoba that report through the [Provincial Transfusion Practice Committee](#) to Manitoba Health.

Choosing Wisely Canada launched in 2014 with recommendations that identify tests and procedures commonly used that are not supported by evidence. The current top [ten things patients and physicians should question](#) in Transfusion Medicine are important to understand. These recommendations can be found at choosingwiselycanada.org.

2. Vein to Vein

The phrase vein to vein describes the scope of transfusion medicine that encompasses donor collection, product preparation, transfusion and includes recipient follow up and evaluation. The concept of vein to vein traceability was a result of the Krever Commission's recommendations to improve patient safety.

This process is regulated by Health Canada and is made up of several organizations in a complex multidisciplinary health care collaboration. CBS and Shared Health are accredited by the College of American Pathologists (CAP). Regional Health Authorities are accredited by Accreditation Canada. This organization requires that blood and blood products are traceable from donor to recipient so that any product may be traced back to a particular donor. This allows identification of potentially contaminated or infectious blood or blood product so transfusion reaction investigations can be initiated. Based on the results of transfusion reaction investigation, blood and blood products may be removed from inventory to reduce the potential for adverse events in other recipients.

Each team member in the organization has a responsibility in ensuring the traceability and safety of all blood products. Policies and procedures are written in accordance with the standards of the accrediting body to assist team members through this process.

3. ABO Compatibility

The ABO blood group system was first discovered in 1907. The four blood groups are A, B, AB and O. Later in 1939 the Rhesus (RH) systems was discovered. Rh antigens are D, C, c, E and e. The Rh D antigen affects all Rh D negative women of childbearing age. Anti-RHD antibodies can be produced as a result of a pregnancy or a transfusion. ABO antibodies are present in all healthy adults. To determine a patient's blood group one needs to identify which if any of the A and B antigens are present on the surface of the red blood cells. If the antigens are absent from the red cell surface they will be present in the plasma.

Patient blood group	Antigens on red cell	Antibodies in plasma
A	A	Anti-B
B	B	Anti-A
O	none	Anti-A and Anti-B
AB	A and B	none

Antigens stimulate an immune response. Antigens of transfused red blood cells must match their own antigens. Antibodies are capable of reacting with A or B antigens on the surface of donor red cells. All blood and blood components should be ABO compatible except in an emergency when non-ABO specific products can be substituted.

Apart from the A and B antigens on red blood cells, there are many more but less common antibodies that can develop as a result of transfusion or pregnancy. Testing of a patient specimen to determine the presence of ABO and RH type and screening for the presence of atypical red cell antibodies in the plasma is known as Type & Screen (T&S). The presence of these antibodies makes crossmatch more difficult.

People with blood type O are considered *universal donors*. Type O blood contains no antigens and is compatible with all ABO types. Blood type AB is the least common and considered *universal recipients* as they can receive any type of blood since there are no antibodies present.

4. Special Considerations for Pediatrics

Children under the age of three months have little or no antibodies present in the plasma. A pre-transfusion sample is collected to conduct ABO and RH blood grouping and to detect clinically significant red cell antibodies.

5. Traceline®

Traceline® is the software that Canadian Blood Services and Shared Health use to track blood and blood products from donation through distribution, transfusion and follow up. Inventory and maintenance of the cold chain are tracked via bar code and computerized thermometer with USB attachment. Traceline® also includes patient records and electronic crossmatch capability. This system depends on positive patient identification at the bedside and before transfusion to maintain patient safety.

Paper documents seen at the bedside include the **Transfusion Medicine Results Report** (TMRR), Record of Transfusion, Emergency Record of Transfusion, and Antibody Report. The Transfusion Medicine Results Report provides details on the patient's ABO, RH type, and antibodies if applicable, it is valid for 72 hours for inpatients and 21 days for preoperative assessment clinic (PAC) patients.

An **Emergency Record of Transfusion** comes attached to a unit of uncrossmatched blood or blood product; it must be signed by the ordering physician and returned to the blood bank 15 minutes after start of transfusion. A **Record of Transfusion (ROT)** comes with a unit of blood or blood product and must be signed, dated and returned to the blood bank 15 minutes after start of the transfusion. This completes the vein to vein process for traceability.

6. Standards for Accreditation

Standards are norms of practice that are used by regulating bodies to enhance safety and quality. They define a core set of requirements to attain a defined level of quality in the service being provided. They apply to all nurses regardless of their role. Compliance with them is voluntary but necessary to meet and maintain accreditation.

In contrast, **regulations** are mandatory; they are legislated. Regulations apply the standards through the force of law and potentially could include judicial penalties for non-compliance.

Standards	Regulations
<p>CAN/CSA Z902-15 Standard for Blood and Blood Components; this set of standards are referenced by the national hospital accreditation body, Accreditation Canada</p> <p>American Association of Blood Banks (AABB) MANQAP has adopted the AABB standards for transfusion medicine services</p> <p>College of American Pathologists (CAP) St. Boniface General Hospital, Health Sciences Centre, and the Canadian Blood Services- Winnipeg Centre are all accredited according to CAP standards.</p>	<p>Health Canada Blood Regulations The Blood Regulations contain safety requirements with respect to blood for transfusion or for further manufacture and apply to all persons or establishments who perform any of the following activities related to blood :</p> <ul style="list-style-type: none"> • processing (donor suitability assessment, collection, testing and blood component preparation) • transforming (washing, pooling and irradiating blood intended for transfusion) • labeling • storing • record keeping • importing (for transfusion) • distributing • Error, accident and adverse reaction investigation and reporting.

Guidelines address practice related issues; help nurses to understand their responsibilities and how to make safe decisions regarding their practice. Best Practice Guidelines offer some flexibility and are suggested to be the most effective and efficient way of attaining safe practice. These are suggestions but may not be absolute requirements.

Accreditation is about quality improvement and patient safety. It looks at how well an institution of facility meets national standards of excellence, so it can provide the best possible care and service to patients and clients.

The accrediting body applies what is observed /reported to the standards that they set forth. The WRHA receives its accreditation through Accreditation Canada. Blood Banks at St. Boniface Hospital and Health Sciences Centre receive accreditation through the College of American Pathologists (CAP).

The guidelines in section 2 of the MTBPRM are based on the standards of the relevant accrediting bodies and are meant to translate to nurses what is expected of them in regards to safe and efficient administration of blood and blood products. They have been written to offer flexibility and encourage critical thinking. In case of discrepancy between the guidelines in this resource manual and the site or regional policy, the site policy shall prevail.

The use of the term “shall” in this document implies that the statement is mandated in the standards. Failure to comply with these guidelines means that the facility does not meet current acceptable accreditation standards.

The use of the term “should” in this document implies that the guideline appears to be scientifically valid or useful and it is recommended that this practice be implemented.

7. Electronic Resource Material

Printed versions of any document may not be the most current version. Although every effort to ensure that all information is accurate and complete, documents and policies are regularly under review and in the process of being amended and blood product information/inserts may change. The most current version of the document applies. This would apply to the guidelines in this resource manual and especially the Product Monographs. Users should verify that any policy is the most current policy before acting on it. Contact the Transfusion Medicine Hematopathologist on call if required. To contact the TM on call, use your local paging service. If no paging service exists, use HSC paging at 204-787-2071.

8. Qualified Transfusionist

A qualified transfusionist is a trained health care professional working within their scope of practice according to the **Regulated Health Professionals Act (2018)**. This act has the responsibility of administering blood, blood components and plasma protein products in accordance with regional/ site policies. Some examples of a qualified transfusionist are registered nurse, licensed practical nurse, nurse practitioner, respiratory therapist, physician, clinical assistant and physician assistant.

Student nurses are not qualified to administer blood, blood components, or plasma protein products. As per the CRNM, student nurses do not hold professional liability protection and cannot be delegated to perform this activity as they are not accountable nor yet competent. Students should be encouraged to participate as a third person in the identification of any blood product. That is, two qualified transfusionists are responsible for the 2-person check and the student may observe. Student nurses may participate in monitoring of patients receiving blood products but should not be the sole person providing direct observation during the first 15 minutes of transfusion. The qualified transfusionist is ultimately responsible for monitoring patients for transfusion reactions.

9. Best Blood Manitoba

Best Blood Manitoba is a collaboration of WRHA Blood Management Service, Shared Health, and Canadian Blood Services. Formally founded in 2014, the BBM website is jointly maintained by this partnership. The MTBPRM is a living document on the BBM website which is accessible to all health care providers. If difficulties arise, ensure cache is cleared and browser is current before contacting Blood Management Service at 204-926-8006.

10. Additional Resources:

[CBS Clinical Guide to Transfusion](#)

[Bloody Easy 4](#)

[Choosing Wisely Canada](#)

11. References

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