

Transfusion Committee Handbook

Version 3
September 2019



Inspiring and facilitating best
transfusion practices in Ontario.



Preface

This document is designed to be used as a reference guide for all Transfusion Committee members as a resource for items related to the mandate of the committee.

Note: Pages three through six of this handbook are intended to be an orientation to joining a Transfusion Committee. This will provide valuable background information on the blood system in Canada and help to define the purpose of a Transfusion Committee.

Acknowledgements

Ontario Regional Blood Coordinating Network (ORBCoN) is funded by the Ontario Ministry of Health to provide educational resources for Ontario hospitals to ensure blood is utilized appropriately and safely.

We would also like to acknowledge the hospitals and other groups who have generously shared examples of their documents and resources that contributed to the creation of this handbook for Transfusion Committees:

London Health Sciences Centre
Ontario Transfusion Coordinators (ONTraC)
Trillium Health Partners
TTISS Education Working Group

Disclaimer

The publisher, author(s)/general editor(s) and every person involved in the creation of this publication, whether directly or indirectly, shall not be liable for any loss, injury, claim, liability or damage of any kind resulting from the use of or reliance on any information or material contained in this publication. This publication is intended for information purposes only, without any warranties of any kind. Without limitation, the publication is not intended or designed to constitute or replace medical advice or to be used for diagnosis. If specific information on personal health matters is sought, advice from a physician or other appropriate health professional should be obtained. Any decision involving patient care should be based on the judgement of the attending physician according to the needs and condition of each individual patient. The publisher, author(s)/general editor(s) and every person involved in the creation of this publication disclaim all liability in respect of the results of any actions taken in reliance upon information contained in this publication and for any errors or omissions in the publication. They expressly disclaim liability to any user/reader of the publication.

Table of Contents

Welcome to your Transfusion Committee.....	3
Special Roles on the Transfusion Committee	6
Agenda Items for your Transfusion Committee	8
Blood Utilization and Wastage Review	8
Guideline Development and Review	10
Policy Development and Review.....	11
Quality and Safety Review.....	12
Review of Adverse Reactions to Blood Components/Products.....	15
Incident Management Review	17
Changes to Blood Components/Products	17
Education about Blood Transfusion	19
Massive Hemorrhage Protocols	22
Disaster and Contingency Planning Related to Blood Transfusion.....	22
Transfusion Committee Information	24
Transfusion Committee Member’s Code of Conduct	24
Ethical Decision Making	24
References	26
Appendix A: TTISS Algorithm for Reporting Adverse Transfusion Events.....	28
Appendix B: Standards Relating to Transfusion Committees in Canada	29
Appendix C: Example of Terms of Reference of a Transfusion Committee	33
Appendix D: Examples of Transfusion Committee Agendas.....	35
Appendix E: Example Conflict of Interest Guidelines	37
Appendix F: Example of a TSO Job Description.....	39
Appendix G: Example Maximum Surgical Blood Order Schedule	41
Appendix H: Example Pre-Operative Risk Assessment for Blood Transfusion Tool.....	43
Appendix I: Sample template for e-mail to ordering physician when red cell transfusion does not meet transfusion guidelines, per Laboratory values.....	44
Appendix J: Example Transfusion Order Set.....	45
Appendix K: ONTraC Perioperative Optimization and Anemia Management Algorithm	46

Welcome to your Transfusion Committee

Why were you asked to join this committee?

The Transfusion Committee needs representation from the physicians and nurses who order and administer blood for patients as well as from the laboratory that is responsible for providing blood for transfusion. The responsibility for ensuring blood transfusion occurs safely at a hospital lies, in part, with the Transfusion Committee. You have been asked to participate on this committee because you can provide valuable expert knowledge from your area of specialty on how well the transfusion service meets your needs as well as those of your patients.

What is the mandate of the Transfusion Committee?

- ❖ To ensure blood is ordered appropriately and administered safely
- ❖ To ensure action is taken to minimize wastage of blood components and products
- ❖ To review reports of adverse reactions, incidents and complaints, discuss how to learn from them and make recommendations for their prevention to improve patient safety
- ❖ To provide health care professionals in your facility with current information and education relating to blood transfusion
- ❖ To review, edit and provide feedback on policies, procedures and guidelines to ensure transfusion practices are evidence-based and represent current best practices
- ❖ To review transfusion audit reports and make recommendations for transfusion process improvement

What do you need to know about the blood system?

Where does blood come from?

The majority of blood for transfusion is collected as whole blood from volunteer donors in Canada by Canadian Blood Services (CBS) and, in Quebec, by Héma-Québec (HQ). Each whole blood donation is processed into blood components (red blood cells, platelets, plasma or cryoprecipitate) for distribution to hospitals for transfusion to patients. Platelets prepared from whole blood donation are provided as a pool from four donations.

Some components are collected through a process called apheresis which results in the collection of specific components like platelets and plasma from a single donor. Blood components provided by CBS and HQ are leuko-reduced (LR). Transfusable plasma in Canada is predominantly from male donors to reduce the risk of transfusion related acute lung injury (TRALI). (1)

CBS and HQ are tasked with screening volunteer donors to ensure the blood collected will provide the most benefit to recipients while minimizing the risks. This process includes screening each donor using a questionnaire and health check interview and testing the

collected blood for pathogens that could be transmitted to the recipient. Both CBS and HQ must adhere to strict regulatory requirements mandated by Health Canada to ensure the blood supply is as safe as possible for all Canadians.

CBS and HQ ship some of the plasma collected from Canadian donors to manufacturing facilities in the United States and Europe to further process the plasma into plasma protein products (PPP). CBS and HQ must then purchase the manufactured products to issue them to hospital transfusion services for Canadian patients. Examples include coagulation factor concentrates used primarily for hemophiliac patients and blood derivatives such as albumin and immunoglobulins (IG) such as Intravenous Immune Globulin (IVIG), Rh Immune globulin (RhIG) and Hepatitis B Immune globulin (HBIG). As Canada is currently not self-sufficient with its supply of plasma to manufacture enough products for all Canadian patients, the majority of these products must be produced from human blood. This blood may be collected from paid donors and is sourced from companies based in the United States and Europe. These products require complex manufacturing processes and are often very costly.

Who pays for blood in Canada?

CBS and HQ are funded by the Provincial and Territorial Ministries of Health to collect, process and distribute blood components to hospitals in Canada and to purchase the required quantity of manufactured blood products from the various pharmaceutical suppliers licensed to provide these products in Canada. Blood components and products are provided by CBS and HQ to hospital transfusion services at no additional charge.

The funding formulas from each province are currently based on the relative percentage use of red blood cells within each province in addition to the cost of manufactured products issued to hospitals within each province.

Are there any 'rules' to follow relating to the handling and use of blood in Canada?

The blood suppliers and manufacturers do considerable manipulation of blood into the components and products mentioned earlier, those organizations have been heavily regulated by Health Canada for many years. In October 2014, new blood regulations were introduced through Health Canada (Health Products and Food Branch) to regulate processes relating to management of blood for transfusion that occurs at hospitals. The *Blood Regulations* (2) fall under the authority of the *Food and Drugs Act* and apply to all persons or establishments that process, label, store, distribute or transform blood (pool, separate, wash, irradiate) for transfusion or further manufacture. These regulations reference the national standards developed by subject matter experts in the field of transfusion medicine.

- ❖ Canadian Standards Association (CSA) National Standards for Blood and Blood Components CAN/CSA Z902
- ❖ Canadian Society for Transfusion Medicine (CSTM) Standards for Hospital Transfusion Services

Hospitals are monitored for compliance to these regulations through inspections by Health Canada. In addition to this, assessments by Accreditation Canada (3) and, in Ontario, through the Institute for Quality Management in Healthcare (IQMH) Accreditation division. (4) Consequences of non-compliance to the Health Canada regulations or to the IQMH requirements can have significant impact to hospital operations including the loss of hospital accreditation and loss of laboratory license.

In September 2015, requirements for reporting adverse events to transfused components were added to the new regulations for hospitals that transform blood components/products. Adverse events relating to transfusion need to also be reported to Canadian Blood Services (if related to product quality) and should be reported to the Ontario Transfusion Transmitted Injuries Surveillance System (ON TTISS). The responsibility for reporting adverse events to these external organizations lies with your Hospital Transfusion Service (HTS). ON TTISS has developed a reporting algorithm to aid in clarifying reporting requirements for hospitals (see Appendix A).

How do these Standards and Regulations apply to Transfusion Committees?

There are specific standards that outline the requirements of Transfusion Committees, including the need for Terms of Reference for the committee, membership of the committee and frequency of meetings (at least quarterly).

A list of the standards relating specifically to the Transfusion Committee appears in Appendix B of this handbook.

What will you need for your committee meetings?

You should be provided with your Transfusion Committee's Terms of Reference. A generic version is provided in the appendices of this handbook (see Appendix C).

What will be discussed at Transfusion Committee meetings?

Agendas may include discussions about:

- Blood utilization and wastage
- Development and approval of guidelines for ordering blood for transfusion (including order sets for transfusion)
- Quality Improvement initiatives related to transfusion
- Transportation of blood and blood products within and outside your hospital
- Policies to improve the use and provision of blood for transfusion including informed consent
- Audits on blood utilization and administration
- Adverse reactions that are reported during or following a blood transfusion
- Incidents and errors or 'near misses' related to blood for transfusion
- New products or changes to products offered through CBS or HQ
- Dissemination of transfusion information and education, staff training and competency

- Massive hemorrhage protocols
- Contingency/emergency planning for potential blood shortages

Within this handbook, you will find brief outlines of each section that may be discussed at a Transfusion Committee meeting and suggested tools that may support committee members in fulfilling their role. Example agendas are provided in Appendix D.

Special Roles on the Transfusion Committee

Chairperson

The chairperson's role on the Transfusion Committee is to:

- Ensure Terms of Reference are developed and approved and provided to all members
- Schedule meetings to ensure the committee meets at least quarterly
- Set agendas to ensure the committee can fulfill its mandate
- Encourage all members to participate equally in discussions and provide their opinion
- Ensure committee members are provided with the data and tools required to enable them to develop recommendations
- Arrange for minutes to be distributed, ensure action items are reviewed and completed
- Liaise between the Medical Advisory Committee (or equivalent professional advisory committee) and the Transfusion Committee including bringing recommendations forward to that committee
- Maintain awareness of members about the ethical aspects of their decision making
- Provide an opportunity for all members to declare a conflict of interest at any time (see Appendix E for an example of conflict of interest guidelines)

Secretary

The secretary's role on the Transfusion Committee is to:

- Record attendance at each meeting
- Record and distribute minutes of each meeting, ensuring action items and decisions and recommendations are documented within the minutes
- Distribute background documents for discussion to committee members as required
- Assist the chairperson in scheduling meetings as required

Transfusion Safety Officer

Some hospitals have created a role for a healthcare professional, with either Nursing or Laboratory background, whose focus is to improve patient safety relating to blood transfusion. This person is often tasked with developing policies and procedures for patient identification and blood administration, reviewing blood utilization, following up and reporting adverse reactions and incidents related to blood transfusion and developing and delivering educational programs. If the hospital does have a Transfusion Safety Officer, they should be a member of the Transfusion Committee.

Transfusion Safety Officers will often perform audits and present data to the Transfusion Committee for review and discussion to develop recommendations to improve performance and prevent errors and incidents. These activities can also be performed by either nursing or laboratory personnel, but, having someone dedicated to this role is often more effective.

A generic job description for a Transfusion Safety Officer appears in Appendix F of this handbook.

Remember you are vital to your Transfusion Committee

Your input can ensure that patients at your hospital receive safe and effective blood transfusion therapy only when it is truly needed. You will become more familiar with your hospital's guidelines for ordering and administering blood, the benefits and risks associated with it, as well as contributing to recommendations to prevent errors and improve patient safety.

As a participating member on the Transfusion Committee, you will become more knowledgeable on blood and any new practices related to the use of blood or its alternatives. Blood is a precious resource that requires effective management to ensure an adequate and safe supply for all Canadians. Your active participation plays an important role in ensuring the committee fulfills its mandate.

We are confident that you will find your participation on the Transfusion Committee rewarding.

Agenda Items for your Transfusion Committee

Blood Utilization and Wastage Review

Blood utilization review includes an assessment of: blood inventory management; utilization guidelines; blood ordering practices; blood administration practices; and review of standardized protocols such as massive transfusion.

- Blood utilization data and graphs are provided to laboratories on a biweekly basis from CBS providing valuable site-specific data that can be reviewed during the Transfusion Committee meeting.
- Blood inventory management can include supply issues from the blood supplier, blood wastage rates, introduction of new products and inventory levels.
- Review of blood ordering practices through audits
- A Maximum Surgical Blood Order Schedule (MSBOS) is a tool for transfusion services, surgical services and anesthesia to predict procedure specific blood utilization. The goal of using a MSBOS is to raise efficiency without compromising patient safety. (5) (Refer to Appendix G for an example)
- A risk assessment table can be an alternative to a MSBOS and is based on the risk of the patient requiring blood transfusions based on the procedure itself (see Appendix H for an example). Where used, 'on demand' blood can be requested if needed
- Review of blood administration practice can involve monitoring for informed consent for transfusion, review of blood issuing and blood infusion (e.g. beside audit) to monitor compliance with hospital policies and procedures.

Why should a Transfusion Committee monitor blood product utilization and wastage?

- To improve patient care and safety – identify cases of over-transfusion or under-transfusion
- To ensure efficient and effective use of the blood products in your facility
- To reduce the cost to the healthcare system due to unnecessary transfusion
- To ensure any trends or patterns in utilization are identified and discussed
- It is a requirement of Canadian Standards Association (CAN/CSA Z902) (6)
- It is a requirement of Canadian Society for Transfusion Medicine Standards. (7)

Examples of tools available to help review blood product utilization:

- ✓ 3-year utilization graphs (trend reports) available from CBS
- ✓ Crossmatch to Transfusion Ratio (C:T)*
- ✓ MSBOS (example see Appendix G)
- ✓ Pre-Op Order Guidelines (example see Appendix H)

- ✓ ORBCoN audit tools (available on www.transfusionontario.org)
- ✓ Follow up communication to ordering physician re: appropriateness (example see Appendix I)
- ✓ Use of quality indicators for transfusion such as those promoted in the Ontario Transfusion Quality Improvement Plan and Toolkit

* Note:

Literature indicates that a C:T ratio greater than 2.0 indicates overuse of crossmatching. Tying up inventory through excess advance crossmatching is no longer best practice. The C:T ratio does not apply to facilities using a 'just in time' crossmatch practice such as immediate spin or electronic crossmatch. (8)

Additional Report Tools/Resources:

1. ORBCoN Inventory Calculators for red cells and platelets.
The inventory calculator tool is based on distribution of blood groups in the population and the amount transfused in a year to give a rough estimate of how much of each blood group is used, on average, each day and how much should be stocked on site (also termed Hospital Inventory Index or HII). For example - a 'lean' HII for red blood cells is 6-8 days, but most hospitals have a HII of 9-10. An explanation of how to use the inventory calculators to determine inventory levels appears in the Inventory Management Toolkit. Regular review of inventory levels in comparison to actual units of blood transfused is encouraged to ensure your hospital is not over-stocking.

<http://transfusionontario.org/en/documents/?cat=inventory-management-toolkits>

2. Canadian Blood Services Trend Reports.
Data collected and submitted to CBS by hospitals every month is collated in a data warehouse, and then made available to hospitals through password protected web access. The information is refreshed biweekly. Information on the number of units outdated by blood group, amount transfused and amount received all help to provide utilization data for reporting. Your hospital transfusion service personnel will have access to these reports/graphs. If your hospital reports their red blood cell inventory levels to CBS regularly, the average daily red cell demand (ARD) and HII will be displayed here as well.

<https://www.blood.ca/en/hospitals/blood-component-and-product-disposition-system>

3. Review of red blood cell (RBC) and frozen plasma (FP) ratios per active inpatient treatment days can be used for peer comparison. (9) If your hospital appears out of line with peers, an audit may be warranted.

Why implement Transfusion Guidelines?

Transfusion practice can vary widely by facility and by physician. Guidelines can help support clinical decisions about appropriate transfusion practices and the use of blood components and products. (10)

Establishing facility guidelines for transfusion will help to reduce inappropriate transfusions and increase patient safety. (11) Example guidelines and order sets are provided in the [Ontario Transfusion Quality Improvement Plan and Toolkit](#).

Development of guidelines

Ensure that they are:

- Evidence based
- Appropriate for your facility
- Easy to comprehend
- Easily accessible for clinicians
- Developed with both clinical and laboratory input
- Approved by your Medical Advisory Committee

Order Sets

Hospitals are moving toward preprinted order sets or computerized physician order entry (CPOE) for a variety of patient care situations. They are a predetermined evidence based prescribing tool that hospital physicians and other healthcare professionals can use to effectively and efficiently implement best practices. When a hospital has established guidelines for transfusion they can be incorporated into the order sets to encourage physicians to comply with the guidelines. For example order set see Appendix J.

Why review and monitor?

Medical research is being done every day to help improve therapies for patients and to increase patient safety. Transfusion Medicine is always evolving and practices are continually improving. The committee should be monitoring and reviewing their current practices based on:

- New evidence (i.e. Restrictive Transfusion Strategies <http://www.choosingwiselycanada.org/recommendations/transfusion-medicine/>)
- [Ontario Transfusion Quality Improvement Plan and Toolkit](#) promotes use of an evidence based restrictive transfusion policy to promote increased patient safety and provides examples of guidelines and other tools to promote a more restrictive approach to the transfusion of red blood cells.

- Increased use of alternatives to transfusion in the management of anemia, i.e. Erythrocyte Stimulating Agents (ESAs) and Intravenous (IV) Iron. Refer to Appendix K for the [ONTraC Perioperative optimization and anemia management algorithm](#).
- Opportunities to avoid the use of blood products for non-urgent warfarin reversal (<https://www.nacblood.ca/resources/guidelines/PCC.html>)
- An algorithm for the management of patients presenting to the Emergency Department with iron deficiency anemia. (12)

Policy Development and Review

Why should Transfusion Committees determine Transfusion Policies?

Policies, processes and procedures describe the purpose and objectives of the facility, how processes are anticipated to function, how they work together, how to perform the processes, areas of risk or control, what their requirements are, how to implement them and how to measure or evaluate them.

Many of the standards mandating the existence of a Transfusion Committee with defined Terms of Reference and minimum meeting intervals also charge the Transfusion Committee with defining or approving transfusion policies. (13) (6)

The clinical perspective in addition to the laboratory perspective is critical in obtaining the safest and most practical policies for transfusion activities. The members of the Transfusion Committee can help provide this input on behalf of, and preferably in collaboration with, members of their own departments. Review, revision and approval of these policies should be documented in the Transfusion Committee minutes, creating a record of the transfusion policy identification, development and approval process. It also ensures a transparent process to clinical areas, departments, administration and auditors.

What types of policies should Transfusion Committees consider?

Some of the key policies related to transfusion at your hospital (or group of hospitals if you have a regional Transfusion Committee model) that should be developed or reviewed by the Transfusion Committee are:

- Informed consent for transfusion and protocol for refusals
- Medical indications for blood products and ordering practices
- Patient identification for specimen collection and blood product administration
- Administration practices and guidelines/monographs for adults, neonates and pediatric patients where appropriate
- Massive hemorrhage protocols, including massive hemorrhage in obstetrical patients
- Non-conformance/error reporting, complaints, corrective and preventative measures, monitoring and evaluation from the laboratory, clinical areas and other pertinent departments

- Management and performance of audits
- Lookback/Traceback for reported transfusion transmitted infections
- Introduction of new blood products
- Blood shortage management
- Staff training and on-going competency for all staff testing, administration and handling blood components/products

ORBCoN has developed many tools to assist hospitals with development of transfusion related policies. Some of these are listed below:

1. The Informed Consent Card
2. 8 Rights of Transfusion Card
3. Bedside Audit Toolkit
4. Patient information pamphlet
5. e-Tools that can be used as a competency tool for technologists, nurses and physicians
6. Immune Globulin (IG) Toolkit
7. Bloody Easy handbooks
8. Inventory Management Toolkit
9. Home Infusion Toolkit
10. Ontario Contingency Plan and Toolkit for the Management of Blood Shortages
11. Introducing a New Blood Component or Product to Your Hospital
12. Ontario recommendation consensus statements on management of Massively Hemorrhaging patients

All of the above can be found on www.transfusionontario.org

The regular review of policies and procedures for accuracy, currency and relevance is another important aspect of policy and procedure development.

Quality and Safety Review

Quality and safety reviews are essential in ensuring that quality improvement and risk management activities are planned, initiated, monitored and evaluated.

When reviewing quality and safety for Transfusion Medicine the committee should be reviewing and discussing the following:

Quality Improvement Plan (QIP)

What is a QIP in Healthcare?

It is a tool used to track performance in identified priority areas like patient safety. It promotes ongoing commitment to achieve system wide quality and safety best practices that improve patient safety and outcomes. It also provides accountability for reaching the highest possible quality and value for healthcare.

Hospitals are required to have established Quality Committees (QC) that develop an annual QIP which is submitted to Health Quality Ontario and the achievements of targets set out

in the QIP are reported. <https://www.hqontario.ca/Quality-Improvement/Quality-Improvement-Plans> The Quality Committee also reviews and monitors errors and critical incidents and improvements in quality and safety for patients. The Transfusion Committee and the QC should work closely together in the management of quality improvement and the review of incidents related to blood transfusion.

[A Provincial QIP](#) template has been developed for Transfusion Medicine in Ontario to help hospitals improve and standardize the ordering and administration of red blood cells (RBC). The plan has been aligned with other provincial and national programs like [Choosing Wisely Canada](#) and [Health Quality Ontario](#). Quality indicators have been identified to help hospitals measure and monitor the goals for improvement. Hospitals can use this as a building block in developing their own quality plan for transfusion medicine. See ORBCoN Quality Improvement Plan toolkit at www.transfusionontario.org. All hospitals utilizing this resource are encouraged to track their process in the tool provided on the website so that both individual hospital and province-wide quality progress in transfusion can be measured and reported.

Audits

What are audits?

The general definition of an audit is the inspection and examination of a process or quality system to ensure compliance with requirements for an organization, function, process, product or step.

A function of the hospital Transfusion Committee is to assess and review the results of audits of transfusion practices at the hospital. Auditing can improve an organization's effectiveness and efficiency by leading to recommendations that promote continuous quality improvement of transfusion practice. As part of the audit process, it is essential that the findings of audits, including any corrective action implemented, be documented, analyzed and shared.

Why should audits be done?

- The Canadian Society for Transfusion Medicine requires that each facility perform regular reviews and audits. These internal audits should be performed to verify the appropriate use of blood components/products. (6) (13)
- Audits are an integral part of a quality management system to ensure the needs of patients are continuing to be met and any "instances where practice does not comply with operational policies, processes or procedures" are identified and actions are taken to correct them. The Institute of Quality Management in Healthcare requires that the laboratory participates in Quality Improvement activities and that some of these activities shall include outcomes of patient care. (14)

What kinds of audits should the Transfusion Committee get involved with?

- Regular evaluations of blood ordering and transfusion practices should be conducted. Specific areas that are important to address are: ordering, distribution, handling, issuing, and administration of blood components and blood products.
- Additional auditing categories may include: policies and procedures, facilities management, training/personnel qualifications and competency, quality assurance, complaints/deviations, error/accident trends, adverse events, testing and lookback/traceback. (15)

The format of any audit/review process must be established by each facility. A blood utilization review must include the criteria for appropriate blood utilization. Each review can be conducted either prospectively or retrospectively, and data collection can be performed manually or by accessing laboratory information systems.

What audit tools are available?

Bloody Easy Audits is an electronic tool that has been developed to aid Transfusion Services and Transfusion Committees in the audit process. This tool enables the user(s) to access the tool at any time and enter specified audit results into a web-based system. Upon completion of the audit period, reports can be automatically generated and used to report to the specific committees in your facility. Currently, there are five audits available for use on ORBCoN's website: Platelets, Bedside audit, Frozen Plasma audit, Specimen Collection audit and the Red Blood Cell audit. To obtain program and log in information please contact your regional ORBCoN office as registration is required to access the audit tools. New audit tools may be added in the future.

Note: Your transfusion service may already have been granted access to these audit tools. They are only available for use by hospitals in Ontario.



What types of reactions/events should be discussed at your Transfusion Committee meetings?

A transfusion is an important component of numerous patient therapies. Transfusions, however, have potential serious risks. The Ontario Educational Committee for the Ontario Transfusion Transmitted Injuries Surveillance System (TTISS-ON) has developed a list of signs and symptoms to watch for along with a description of what to expect and how to treat an adverse transfusion event. This table is also included in the Bloody Easy Blood Administration handbook.

Figure 1: TTISS (Transfusion Transmitted Injuries Surveillance System) Transfusion Reaction Chart

TTISS-ON TRANSFUSION REACTION CHART						
IMMEDIATE ACTIONS!	SIGNS & SYMPTOMS		USUAL TIMING	POSSIBLE ETIOLOGY	RECOMMENDED INVESTIGATIONS	SUGGESTED TREATMENT AND ACTIONS
<ol style="list-style-type: none"> 1. STOP the transfusion 2. Maintain IV access 3. Check vital signs 4. Re-check patient ID band and product label 5. Notify physician 6. Notify Transfusion Laboratory 	Fever (at least 38° C and an increase of at least 1° C from baseline) and/or Shaking Chills/Rigors	38° C to 38.9° C but NO other symptoms	During or up to 4 hours post transfusion	Febrile non-hemolytic transfusion reaction	No testing required	▲ Antipyretic ▲ With physician approval transfusion may be resumed cautiously if product still viable
		Less than 39° C but with other symptoms (e.g. rigors, hypotension) or 39° C or more	Usually within first 15 minutes but may be later	Febrile non-hemolytic transfusion reaction Bacterial contamination Acute hemolytic transfusion reaction	▲ Group & Screen, DAT ▲ Patient blood culture(s) ▲ Urinalysis If hemolysis suspected (e.g. red urine or plasma) ▲ CBC, electrolytes, creatinine, bilirubin, LDH, aPTT, INR, fibrinogen, haptoglobin, plasma Hb	Do not restart transfusion ▲ Antipyretic ▲ Consider Meperidine (Demerol®) for significant rigors ▲ If bacterial contamination suspected, antibiotics should be started immediately ▲ Monitor for hypotension, renal failure and DIC ▲ Return blood product to Transfusion Laboratory ▲ For additional assistance, contact _____
	Urticaria (hives) Itching	Less than 2/3 body but NO other symptoms	During or up to 4 hours post transfusion	Minor allergic	No testing required	▲ Antihistamine ▲ With physician approval transfusion may be resumed cautiously if product still viable
	or Rash	2/3 body or more but NO other symptoms	Usually early in transfusion	Minor allergic (extensive)	No testing required	Do not restart transfusion ▲ Antihistamine ▲ May require steroid
	Accompanied by other symptoms (e.g. dyspnea hypotension)		Usually early in transfusion	Anaphylactoid reaction/Anaphylaxis	▲ Group & Screen, DAT ▲ Chest X-Ray (if dyspneic) ▲ Blood gases (if dyspneic) ▲ Haptoglobin ▲ Anti-IgA testing	Do not restart transfusion ▲ Epinephrine ▲ Washed/plasma depleted blood products pending investigation ▲ Return blood product to Transfusion Laboratory ▲ For additional assistance, contact _____
		Typically with Hypertension	Within several hours of transfusion	Transfusion associated circulatory overload (TACO)	▲ Group & Screen, DAT ▲ Chest X-Ray ▲ Blood gases ▲ Urinalysis	Do not restart transfusion ▲ Diuretics, oxygen, High Fowler's position ▲ Return blood product to Transfusion Laboratory ▲ Slow transfusion rate with diuretics for future transfusions
		Typically with Hypotension (and change of at least 5% from baseline)	Within 6 hours of transfusion Usually within first 15 minutes but may be later	Transfusion related acute lung injury (TRALI) Bacterial contamination Acute hemolytic transfusion reaction Anaphylaxis	If sepsis suspected: ▲ Patient blood culture(s) If hemolysis suspected: ▲ CBC, electrolytes, creatinine, bilirubin, LDH, aPTT, INR, fibrinogen, haptoglobin, plasma Hb If anaphylaxis suspected: ▲ haptoglobin, Anti-IgA	Do not restart transfusion ▲ Assess chest X-Ray for bilateral pulmonary infiltrates ▲ If TRALI may require vasopressors and respiratory support ▲ If bacterial contamination suspected, antibiotics should be started immediately ▲ Monitor for hypotension, renal failure and DIC ▲ If anaphylaxis suspected, epinephrine ▲ Return blood product to Transfusion Laboratory ▲ For additional assistance, contact _____

* Ontario Transfusion Transmitted Injuries Surveillance System (TTISS-ON)

version 2.1 January 2016 Originally printed in Bloody Easy Blood Administration

Oversight of transfusion practices and adverse events requires active participation of physicians, nursing, laboratory, administrators and other healthcare providers to ensure prevention of adverse events and to identify appropriate corrective actions. Review of adverse reactions can aid in identifying sentinel events, near miss errors and potential product related issues. Implementation and subsequent monitoring of corrective actions can improve patient safety related to transfusion. (11)

Tracking the types of reactions and monitoring incidence rates helps the organization to identify:

- Appropriate treatment of reactions
- Investigation of cause of reaction
- Patient safety risks (e.g. hemolytic reaction due to patient identification error)
- Interventions to mitigate risk
- Prevention of reactions

Hospitals are encouraged to submit their reportable adverse transfusion events on the, [Canadian Transfusion Adverse Event Reaction Form](#) referring to the Canadian ATE TTISS guidelines. Adverse Reaction Summary Reports (both provincial and site specific) available from the Ontario TTISS database can be discussed at Transfusion Committee meetings. Provincial reports can be found at <https://ttiss.mcmaster.ca> Below, is an example of the risk assessment by blood component and adverse transfusion event type take from the Ontario TTISS 2012-2016 Report. Your HTS representative will be able to provide a summary of hospital adverse transfusion reactions as well as provincial reports.

Table 8C: Risk of an ATE by Blood Component and Type of Reaction.

Adverse Transfusion Event	Red Blood Cells (564,916)		Plasma (127,549)		Platelets (84,972)		Cryoprecipitate (64,869)		Multiple Blood Components		Total (842,306)	
	N	Risk	N	Risk	N	Risk	N	Risk	N	Risk	N	Risk
Acute Hemolytic Reaction	17	1:33,230	-	-	1	1:84,972	-	-	-	-	18	1:46,795
Delayed Hemolytic Reaction	41	1:13,778	-	-	-	-	-	-	-	-	41	1:20,544
Anaphylactic Shock	-	-	3	1:42,516	1	1:84,972	-	-	1	-	5	1:168,461
Severe Allergic	11	1:51,356	19	1:6,713	31	1:2,741	-	-	2	-	63	1:13,370
Bacterial Infection	2	1:282,458	1	1:127,549	2	1:42,486	-	-	-	-	5	1:168,461
TRALI	1	1:564,916	-	-	-	-	-	-	1	-	2	1:421,153
Possible TRALI	3	1:188,305	2	1:63,775	4	1:21,243	-	-	3	-	12	1:70,192
TAD	6	1:94,153	1	1:127,549	-	-	-	-	-	-	7	1:120,329
TACO	112	1:5,044	4	1:31,887	8	1:10,622	-	-	18	-	142	1:5,932
Hypotensive Reaction	14	1:40,351	-	-	3	1:28,324	-	-	-	-	17	1:49,547
PTP	-	-	-	-	-	-	-	-	1	-	1	1:842,306
Other/Unknown Pain	30	1:18,831	2	1:63,775	10	1:8,497	1	1:64,869	1	-	44	1:19,143
Delayed Serological Transfusion Reaction (new alloantibodies)	386	1:1,464	-	-	3	1:28,324	-	-	6	-	395	1:2,132
Febrile Non Hemolytic Reaction	598	1:945	15	1:8,503	102	1:833	-	-	25	-	740	1:1,138
Minor Allergic Reaction	181	1:3,121	98	1:1,302	283	1:300	4	1:16,217	24	-	590	1:1,428
Hemochromatosis	1	1:564,916	-	-	-	-	-	-	-	-	1	1:842,306
Total (Risk of Any Type of ATE)	1,403	1:403	145	1:880	448	1:190	5	1:1297	82	-	2,083	1:404

Accessed from <https://ttiss.mcmaster.ca/wp-content/uploads/2017/10/OntarioTTISS-Report-5-Year-2012-2016.pdf> 2019-10-02

Incident Management Review

The current CAN/CSA Z902 standards requires that any incidents, such as errors, accidents and deviations from normal operating procedures be identified, investigated, evaluated and corrective action and preventative measures taken when required. (16) The Transfusion Committee should be a part of the development and maintenance of policies and procedures involving the transfusion of blood components and products, and should be closely involved with the all the steps concerning the incident management process.

IQMH requirements state that the process for formulating corrective action must include an investigation to determine the underlying root causes of the problem. Corrective action shall be appropriate to the magnitude of the problem and risks encountered. (17)

In his primer for healthcare executives written for the Medical Event Reporting System for Transfusion Medicine (MERS-TM), Marx explains that it is through the lessons of our everyday errors and near misses that we can design our work environment to be less error prone and more error tolerant. (18)

The [Canadian Patient Safety Institute](#) provides a toolkit for incident management based on the best available evidence and expert advice. This toolkit is regularly updated and is focused on managing patient safety, quality improvement, risk management and staff training in the healthcare setting. (19)

The investigation of serious errors will usually be performed by trained individuals belonging to the Safety/Quality and Risk Management departments (valuable members of any Transfusion Committee).

The Institute for Quality Management in Healthcare requires the Transfusion Service to apply Risk Management principles to make sure that any incidents or near miss events related to transfusion are investigated and mitigation strategies are implemented to prevent further occurrence. (20)

Changes to Blood Components/Products

New blood components or blood products are introduced in Canada on the advice of the National Advisory Committee (NAC) on blood and blood products (www.nacblood.ca). The NAC is a medical advisory body that has physician representation from all provinces and territories and provides advice on blood and blood products to the provincial and territorial ministries of health that provide funding for the blood system in Canada.

The ministries of health consider the recommendations made by NAC when determining whether a new blood product will receive funding to be supplied to hospitals in Canada.

Occasionally, Canadian Blood Services will remove products from their list of available products if the ministries of health determine they no longer qualify for funding support. It is important for hospitals to assess the impact of such a change to their hospital. There may be implications to hospital funding,

acquisition of the product from an alternative source or finding an alternative product. Hospital personnel will need to be informed and advised of any changes in processes resulting from this.

What Role Does the Transfusion Committee play in approving New Blood Components or Products and Assessing Changes to Available Blood Products?

The Transfusion Committee at each hospital should:

- Determine if the new blood component/ product will be used at their facility
- Develop and approve clinical guidelines for use of the component/product
- Develop, approve and ensure training will be provided around hospital administration policies and procedures
- Determine the quantity and availability of the new component/product
- Plan for phasing out an old component or product to minimize wastage where applicable
- Request or review an assessment of the impact of any changes to blood components or products provided by Canadian Blood Services and make recommendations around any revisions that will need to be made to the hospital acquisition and ordering practices
- Ensure staff (laboratory, medical and nursing) education will be provided about any product changes and the impact to practice
- Audit the use of new component/product once it has been approved and placed into inventory to ensure it is being ordered and used appropriately.

The Ontario Regional Blood Coordinating Network (ORBCoN) has, with input from hospital stakeholders, developed a toolkit to aid in the implementation of a new blood product. The toolkit can be found at www.transfusionontario.org under 'Toolkits'.



Education about Blood Transfusion

Blood transfusion involves personnel from diverse backgrounds with different levels of knowledge and understanding of transfusion. In order to properly and safely accomplish their role in transfusion each individual needs to be trained to the appropriate level. Any person(s) involved in any step in the transfusion process must meet the competency requirements set out in the standards.

CAN/CSA Z902 standards states that each facility shall create, maintain, and document a formal competency assessment program. Competency shall be assessed following training and at regular and routine intervals thereafter. (21)

IQMH requirements state that the hospital and blood transfusion service shall ensure that there is ongoing training for staff involved in blood component/product preparation and administration. (22)

CSTM Standards state that the "Transfusion Service ensures there is a process for an annual competency assessment for all medical, clinical and support staff involved in any transfusion related activity.." (23)

In January 2018, Accreditation Canada released an updated version of their Standards for Transfusion Services. It included prescribing physicians in the requirements for competency related to blood transfusion. (24)

Various tools have been created to help facilities meet the requirements for ongoing competency related to Transfusion Medicine. These resources are available free of charge to Ontario hospitals. All can be found at <http://transfusionontario.org/en/>

Bloody Easy Lite



Bloody Easy Lite is an online learning tool providing basic information for physicians and healthcare professionals who prescribe blood and blood components or blood products. The program offers an optional participant tracking mechanism to assist health care facilities in ongoing transfusion medicine education for healthcare professionals involved in transfusion medicine activities.

Bloody Easy Blood Administration



Bloody Easy Blood Administration is an electronic learning tool that was developed with input from RN's, Transfusion Safety Officers and Transfusion Personnel across Ontario. The content reflects current best practices and you will learn about the risks of transfusion, the significance of the ABO and Rh blood group systems, and what these systems mean in terms of blood compatibility for your patients.

Available in English and French (2015)

Bloody Easy Tech Assessments



Bloody Easy Tech Assessments includes a series of tests intended to provide Medical Laboratory Technologists in Ontario with a mechanism to assess and build on their technical and theoretical knowledge in Transfusion Medicine at both the basic and advanced level. Registration through an assigned site administrator is required. Tests are updated each year. A certificate is available for printing once each module has been completed and passed. Please contact your Regional ORBCoN office for registration information and instructions.

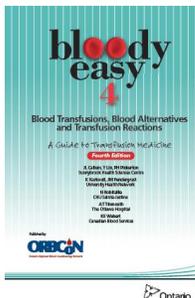
In 2019, Coagulation assessments were added to the program.

Available in English only

Handbooks:

To request hard copies, please visit [ORBCoN Resources](#)

Bloody Easy 4: Blood Transfusions, Blood Alternatives and Transfusion Reactions. A Guide to Transfusion Medicine Fourth Edition



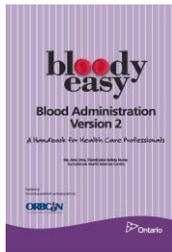
This educational tool provides practical information on Transfusion Medicine in a concise booklet format. It is designed to enhance knowledge of physicians, nurses, and technologists on the clinical use of blood transfusions and blood alternatives.

To request hard copies go to

<http://inventory.transfusionontario.org/>

Available in both English and French. (2016)

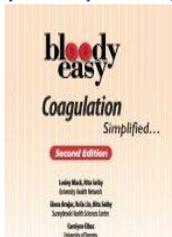
Bloody Easy Blood Administration Handbook



This booklet is ideal for nurses or health care professionals administering blood. It provides an overview of blood and blood products, the risks associated with them, and how they should be administered. In addition, it describes the types of transfusion reactions that may occur.

Available in both English and French and is the companion to the online course (2015)

Bloody Easy Coagulation Simplified



This handbook provides practical information on coagulation. It is designed to enhance the knowledge of physicians, nurses and medical laboratory technologists about the basics of coagulation from laboratory testing to anticoagulant drugs and management of bleeding disorders.

Available in both English and French (2019)

PowerPoint Presentations:

Emergency Blood Management



This slide presentation outlines the background, definitions and phases of the Ontario Blood Shortage Plan and key elements of a Hospital Emergency Blood Shortage Plan. Its intended use is for education of hospital stakeholders about the importance of planning for the possibility of a blood shortage.

Available in both English and French (2016)

http://transfusionontario.org/en/documents/?cat=emergency_blood

Transporting Blood Products Internally



This template can be used to provide initial or refresher training to staff responsible for transporting blood from the laboratory to the patient care area and can be customized to site specific processes.

Available in English only (2017)

<http://transfusionontario.org/en/documents/?cat=transporting-blood-internally>

Blood Administration made Bloody Easy: Module 1 – Transfusing the Patient, Module 2 – Indications and Compatibility and Module 3 – Transfusion Reactions



Inspiring and facilitating best transfusion practices in Ontario.

Bloody Easy Blood Administration

Module 1 – Transfusing the Patient

Content derived from:
Bloody Easy Blood Administration Handbook
Version 2, 2015
Prepared by Ana Linn, RN

These 3 presentations were developed for nurses to support education and training related to the handling and administration of blood.

These PowerPoint presentations are available in both English and French. (2015)

<http://transfusionontario.org/en/documents/?cat=bloody-bloody>

For more information on the above listed tools or other resources that are available please visit www.transfusionontario.org

Massive Hemorrhage Protocols

Hospitals should have a protocol to aid in the management of massively hemorrhaging patients. Studies have shown that outcomes of patients managed with use of a protocol were better than those where there was no protocol in place. (25)

Ontario experts compiled a list of statements to address the most critical aspects of what to include in a massive hemorrhage protocol (MHP). A toolkit will be available in 2020 to provide guidance for all hospitals in the province to ensure a consistent approach is taken in managing patients with massive hemorrhage.

The list of consensus statements (and the toolkit when it is available) may be found here. <http://transfusionontario.org/en/documents/?cat=massive-hemorrhage-protocol>

Disaster and Contingency Planning Related to Blood Transfusion

Blood components/products play a vital role in the provision of healthcare to patients. Unexpected events can occur that may result in a reduction of the supply of blood components or blood products. Hospitals need to have contingency plans in place to mitigate the impact and risk to patients should this occur. (26) Examples of the type of situation that could result in a reduction of supply or the availability of transfusion services include:

- Facility catastrophic event such as fire, flood or earthquake causing building or building system failure
- Local disaster resulting in overwhelming request for provision of blood and/or blood products such as a mass casualty event
- Regional or national event resulting in a severe supply shortage or interruption of the distribution of blood and/or blood products
- A pandemic where blood demand rises but the number of available blood donors declines creating a shortage in components

- Shortages in supply of plasma protein products

Local or Regional Disaster Plans

Most hospital laboratories will have plans in place to address events that would require displacement of laboratory services and large local disaster scenarios affecting a large number of patients. The Transfusion Committee should be familiar with these plans and review them periodically to ensure patient care will be addressed adequately in relation to the provision of blood components and products.

Regional or National Blood Shortage Events

A National plan for the management of Blood Shortages was developed by a working group of the NAC. First released in 2010, it has been revised, most recently in October 2015. (27) The Ontario Ministry of Health, through a working group, developed and released a Contingency Plan for Management of Blood Product Shortages in January 2008. The most current version of the Ontario Plan (2016) is available at http://transfusionontario.org/en/documents/?cat=emergency_blood.

What role would Transfusion Committee members play during a blood shortage?

Each hospital should develop their own plan, addressing their own needs should a blood shortage ever occur. The Ontario Emergency Blood Management Committee developed a toolkit to guide hospitals in developing their own hospital specific blood shortage plan to ensure hospitals take a consistent approach and that patients across the province will be treated equitably. Some hospitals have elected to create a committee (Hospital Emergency Blood Management Committee) to specifically manage communication and triage orders for blood during a blood shortage. Other hospitals may use an existing committee (such as the Transfusion Committee or facility disaster management committee) to serve this purpose. Regardless of which committee is tasked with managing a blood shortage situation, Transfusion Committee members should be familiar with the hospital plans that relate to the management of blood resources in a disaster or critical shortage situation.

Transfusion Committee Information

Transfusion Committee Member's Code of Conduct

In addition to the Terms of Reference of a committee, committee members should abide by a code of conduct that will ensure ethical and timely decision making and professional conduct.

Confidentiality:

Members will consider issues non-confidential unless otherwise advised. Members will observe confidentiality when asked to do so.

Conflict of Interest:

Guidance should be provided to members of this committee to identify and address situations that may arise when an individual is in conflict with their professional, business, volunteer or personal interests. These guidelines serve to preserve the integrity of decisions made by this committee to ensure they serve the best interests of the committee and the organization it serves. (refer to Appendix E for an example of conflict of interest guidelines).

Ethical Decision Making

Situations may arise where “doing the right thing” is not clear. These situations may be referred to as ethical dilemmas, which are not always easily identified. If you or your committee encounters any of the warning signs listed below, there is a significant possibility that there is an ethical dilemma to be resolved:

- A sense of discomfort when the situation is viewed through the lens of being published in a newspaper or viewed on television
- Wanting to proceed in the right direction, but confronting barriers
- Receiving information you wish you didn't have
- An uneasiness caused by competing values (loyalty versus disclosure; safety versus financial prudence)
- Conflict in the group or committee from different perspectives, values, culture and professions
- A unique situation that has not been faced before. Policies and standards of practice do not apply
- An intuitive, gut feeling that something isn't right, also known as the “ick” factor

The most prepared organizations have ethics policies and an established decision framework to guide them with these difficult decisions. The goal of having a framework to guide decision making is to develop a common approach that can be applied to situations where existing policies and processes do not provide sufficient guidance. Some organizations also have ethics specialists that assist teams in reaching the best, most transparent decisions.

What is ethical decision making?

Ethical decision making is a disciplined reflection on how to make decisions about what should be done in a particular situation. Ethical decision-making usually involves four related questions:

- What should we do? (What options are good or right in this context?)
- Why should we do it? (Exploring the values and reasons that support each option.)
- How should we do it? (What plan of action best aligns with these values and reasons?)
- Who should do it? (Who is responsible for making the final decision and enacting and communicating it?)

The Canadian Medical Association (CMA) prepared a code of ethics to be used as an ethical guide for Canadian physicians, including residents and medical students. It is based on the fundamental principles and values of medical ethics and hopes to provide a common ethical framework for Canadian physicians. The following is an example of a responsibility included in the code of ethics guide that falls under responsibilities to society "Recognize the responsibility of physicians to promote equitable access to health care resources". (28)

There are several examples of ethical decision-making frameworks available. One example is available from Trillium Health Partners. "Ethics is about making "right" or "good" choices and the reasons that we give for our choices and actions. Ethics promotes reflective practice in the delivery of health care. Accreditation Canada expects that healthcare organizations will have in place a framework for guiding ethical behavior that is publicly accessible and consistent with the law.". (29)

Open, collaborative and transparent discussion with committee members, each providing their experience and knowledge is often a most efficient method to address situations that may present as an ethical dilemma.

Additionally, committee members should not hesitate to ask for outside assistance and input from non-committee members like staff, volunteers, patients and their families in order to make the best decision in a difficult situation.

References

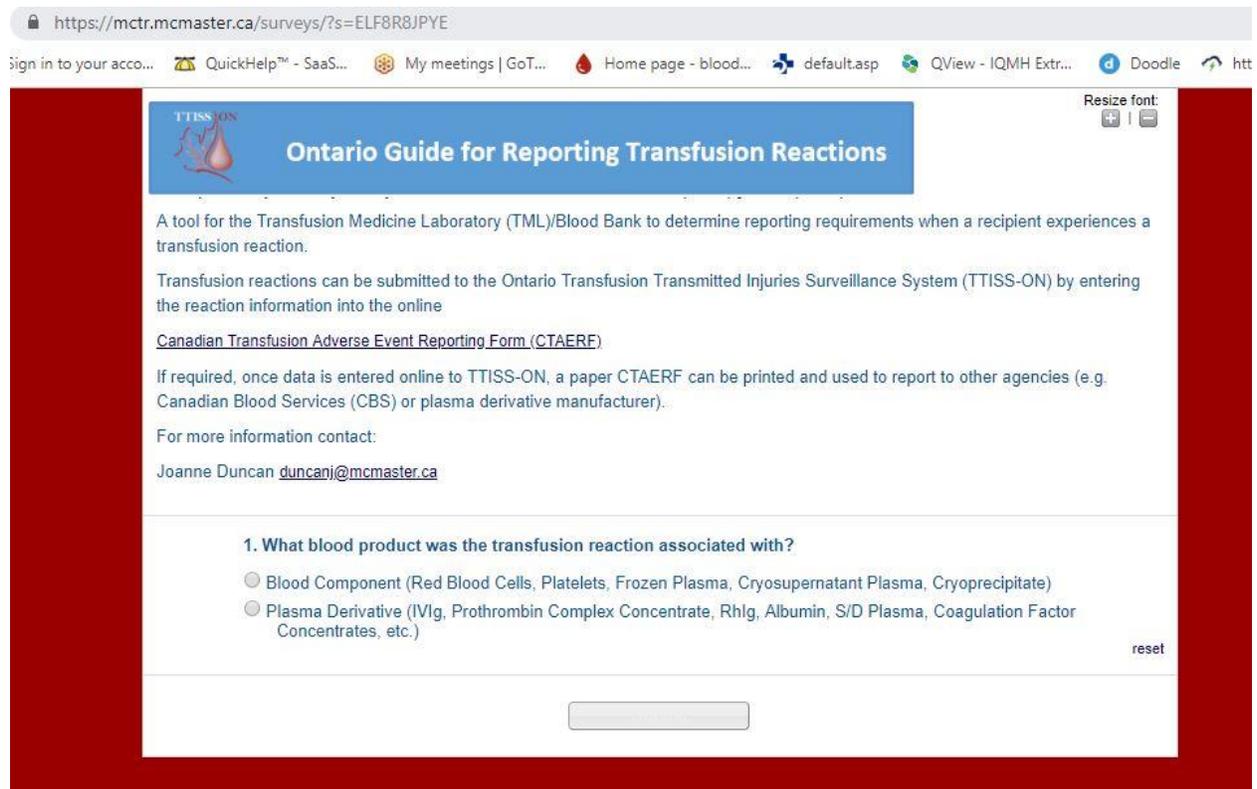
1. Clarke G. Clinical Guide to Transfusion Chapter 2. Canadian Blood Services. [Online].; 2019. Available from: <https://professionaleducation.blood.ca/en/transfusion/clinical-guide-transfusion>.
2. Health Canada. Guidance document: Blood Regulations. Ottawa;; 2014.
3. Accreditation Canada. Standards Transfusion Services ver12. Ottawa;; 2018.
4. Institute for Quality Management in Healthcare (IQMH). Medical Laboratory Accreditation Requirements ver 7.1. Toronto;; 2017.
5. Atrah H et al. The sustained impact of a group and screen and maximum surgical blood ordering schedule policy on the transfusion practice in gynaecology and obstetrics. Clin.Lab.Haem. 1995; 17: p. 177-181.
6. Canadian Standards Association. CAN/CSA Z902 Standards for Blood and Blood Components. Toronto: CSA Group; 2015. No. 4.4.
7. Canadian Society for Transfusion Medicine. Standards for Hospital Transfusion Services ver 4. Ottawa;; 2017 Rev 2018. No. 1.8, 1.9
8. Fung MK, editor. AABB Technical Manual 19th edition. In. Bethesda: AABB Press; 2017. p. 480,565.
9. Quang JK et al. Variations in red blood cell and frozen plasma utilization rates across 62 Ontario community hospitals. Transfusion. 2019 February; 59(2).
10. Callum JL et al. Bloody Easy 4 Toronto: Ontario Regional Blood Coordinating Network; 2016.
11. Saxena S, editor. The transfusion committee: putting patient safety first. 2nd ed. Bethesda: AABB Press; 2013. p123
12. Khadadah F et al. Improving quality of care for patients with iron deficiency anemia presenting to the emergency department. Transfusion. 2018; 58: p. 1902-1908.
13. Canadian Society for Transfusion Medicine. Standards for Hospital Transfusion Services ver 4. Ottawa;; 2017 rev 2018. No 1.9.
14. Institute for Quality Management in Healthcare. Medical Laboratory Accreditation Requirements ver 7.1. Toronto;; 2017. No. II.D.1
15. Walters L. Introducing the Big Q: A practical Quality Primer. In. Bethesda: AABB Press; 2004. p. 179.

16. Canadian Standards Association. CAN/CSA Z902 Standards for Blood and Blood Components. Toronto:, CSA Group; 2015. No. 18.1
17. Institute for Quality Management in Healthcare. Medical Laboratory Accreditation Requirements ver 7.1. Toronto;; 2017. No. II.D.5.2
18. Marx D. US Department of Health and Human Services. [Online].; 2001 [cited 2019 July 4. Available from: <https://psnet.ahrq.gov/resources/resource/1582/Patient-Safety-and-the-Just-Culture-A-Primer-for-Health-Care-Executives>.
19. Canadian Patient Safety Institute. Patient Safety Institute. [Online].; 2015 [cited 2019 July 4. Available from: <https://www.patientsafetyinstitute.ca/en/toolsResources/PatientSafetyIncidentManagementToolkit/Pages/default.aspx>.
20. Institute for Quality Management in Healthcare (IQMH). Medical Laboratory Accreditation Requirements ver 7.1. Toronto;; 2017. No. II.D.1.1
21. Canadian Standards Association. CSA Z902-15 Standards for Blood and Blood Components. Toronto: CSA Group; 2015. No. 4.3.3
22. Institute for Quality Management in Healthcare. Version 7.1. ; 2017. Report No.: Requirement I.B.10 TM 111.
23. Canadian Society for Transfusion Medicine. Standards for Hospital Transfusion Services version 4. ; April 2017. No.2.14.
24. Accreditation Canada. Transfusion Services Standards ver 12. Ottawa;; 2018. No. 4.3.
25. Cannon JW et al. J Trauma Acute Care Surg. 2017; 82: p. 605-617.
26. Institute for Quality Management in Healthcare. Medical Laboratory Accreditation Requirements. ; version 7.1 April 2017. No. I.C.12 TM188.
27. National Advisory Committee for Blood and Blood Products. [Online].; 2015 [cited 2019 July 4. Available from: <https://www.nacblood.ca/resources/shortages-plan/index.html>.
28. Canadian Medical Association. [Online].; 2018 [cited 2019 July 4. Available from: <https://policybase.cma.ca/documents/policypdf/PD19-03.pdf>.
29. Trillium Health Partners. [Online].; 2013 [cited 2019 July 4. Available from: <https://trilliumhealthpartners.ca/aboutus/Documents/IDEA-Framework-THP.pdf>.

Appendix A: TTISS Algorithm for Reporting Adverse Transfusion Events

TTISS provides an online tool to guide users on appropriate reporting of Adverse Transfusion Events (ATE)

Go to: <https://mctr.mcmaster.ca/surveys/?s=ELF8R8JPYE> (accessed 2019/09/10)



The screenshot shows a web browser window with the URL <https://mctr.mcmaster.ca/surveys/?s=ELF8R8JPYE>. The page title is "Ontario Guide for Reporting Transfusion Reactions". The content includes a description of the tool, instructions on how to submit a reaction, and a link to the Canadian Transfusion Adverse Event Reporting Form (CTAERF). The form is currently displaying a question: "1. What blood product was the transfusion reaction associated with?". There are two radio button options: "Blood Component (Red Blood Cells, Platelets, Frozen Plasma, Cryosupernatant Plasma, Cryoprecipitate)" and "Plasma Derivative (IVIg, Prothrombin Complex Concentrate, Rhlg, Albumin, S/D Plasma, Coagulation Factor Concentrates, etc.)". A "reset" button is located to the right of the options. A "next" button is visible at the bottom of the form.

Ontario Guide for Reporting Transfusion Reactions

A tool for the Transfusion Medicine Laboratory (TML)/Blood Bank to determine reporting requirements when a recipient experiences a transfusion reaction.

Transfusion reactions can be submitted to the Ontario Transfusion Transmitted Injuries Surveillance System (TTISS-ON) by entering the reaction information into the online [Canadian Transfusion Adverse Event Reporting Form \(CTAERF\)](#).

If required, once data is entered online to TTISS-ON, a paper CTAERF can be printed and used to report to other agencies (e.g. Canadian Blood Services (CBS) or plasma derivative manufacturer).

For more information contact:
Joanne Duncan duncanj@mcmaster.ca

1. What blood product was the transfusion reaction associated with?

Blood Component (Red Blood Cells, Platelets, Frozen Plasma, Cryosupernatant Plasma, Cryoprecipitate)

Plasma Derivative (IVIg, Prothrombin Complex Concentrate, Rhlg, Albumin, S/D Plasma, Coagulation Factor Concentrates, etc.)

reset

next

Accreditation Canada

Accreditation Canada is a not-for-profit, independent organization that provides accreditation to national and international health care organizations through an external peer review process to improve the services they provide to their patients and clients based on standards of excellence.

Accreditation Canada requirements that apply to Transfusion Committees include:

19.1 The organization has a Transfusion Committee that provides consultation and support on transfusion practices and activities. Guidelines:

The Transfusion Committee

- helps to define blood transfusion policies to the local clinical activities;
- ensures that regular evaluations of blood transfusion practices are conducted;
- sets criteria for the evaluation of ordering practices, usage, administration policies and the ability of services to meet recipient needs;
- recommends corrective measures if necessary;
- disseminates transfusion medicine information and education;
- evaluates reports of adverse transfusion events and transfusion errors within the facility as well as relevant federal and provincial or territorial reports on adverse transfusion events; and
- reviews available alternatives to allogeneic blood transfusion and makes appropriate recommendations on their use.

Accreditation Canada Standards; Transfusion Services v12 2018/04/17
www.accreditation.ca/en/

Canadian Society for Transfusion Medicine (CSTM) Standards for Hospital Transfusion Services

The Canadian Society for Transfusion Medicine is a multidisciplinary society which promotes and supports the best practice in Transfusion Medicine in Canada through education, communication and partnerships. It is through this mandate that the Standards for Hospital Transfusion Services were developed. These standards are intended to be incorporated into Canadian hospitals' policies, processes and procedures.

CSTM Standards that apply to Transfusion Committees include:

1.8: A Transfusion Committee shall be established to:

- a) identify transfusion policies as appropriate to local clinical activities

- b) identify criteria for blood component and blood product utilization
- c) ensure regular audits of transfusion practices are performed, reviewed and appropriate corrective action taken
- d) identify inappropriate use of blood components and blood products and facilitate corrective action
- e) identify available alternatives to allogeneic blood transfusion and development of recommendations on their use
- f) ensure the dissemination of transfusion medicine information and education
- g) review reports of adverse reactions and errors in the facility, as well as relevant governmental reports on adverse transfusion events

1.9: The Transfusion Committee shall:

- a) involve key members of the transfusion community, including physicians, nurses, transfusion service staff, and executive management
- b) meet at least quarterly
- c) The Transfusion Committee may operate regionally

2.2: The TS medical director shall attend all Transfusion Committee meetings or send a designate who is a physician

Canadian Society for Transfusion Medicine, Standards for Hospital Transfusion Services. Ottawa, Ontario; Ver 4 April 2017.

Canadian Standards Association (CAN/CSA) Z902 National Standard for Blood and Blood Components

The Canadian Standards Association (CSA) is a not-for-profit, non-statutory, voluntary association engaged in standards development and certification activities. These standards were developed through a consensus of volunteer experts involved in the Canadian Blood System with varied viewpoints.

CAN/CSA Z902-15 Standards that apply to Transfusion Committees include:

4.4: The transfusion service shall have a Transfusion Committee with documented terms of reference (defining, for example, its membership, scope of activity, and meeting frequency). The role of the committee shall be to provide consultative and support services with relation to transfusion practices and activities. The committee membership shall include key stakeholders, including physicians, nurses, transfusion staff, hospital administration, and other personnel as needed. It shall meet at least quarterly. The purpose of the Transfusion Committee shall be to:

- a) help define blood transfusion policies as appropriate to the local clinical activities
- b) ensure that regular evaluations of blood transfusion practices are conducted

- c) set criteria for the evaluation of ordering practices, usage (including the discarding of blood and blood components), administration policies, and the ability of services to meet recipient needs
- d) recommend corrective measures, if necessary
- e) disseminate transfusion medicine information and education
- f) evaluate reports of adverse transfusion events and all transfusion errors within the facility, as well as relevant federal and provincial or territorial reports on adverse transfusion events
- g) review available alternatives to allogeneic blood transfusion and make appropriate recommendations on their use

Canadian Standards Association *CAN/CSA-Z902-15 A National Standard on Blood and Blood Components*. Standards Council of Canada, Mississauga, Ontario; CSA Z902-15 December 2015.

Health Canada - Health Products and Food Branch

Health Canada Health Products and Food Branch has a mandate to minimize health risk to Canadians and maximize safety. In October 2014, regulations were brought into effect to ensure safe handling and management of blood components both at Canadian Blood Services and hospital transfusion services. The blood regulations fall under the Food and Drugs Act and apply to processing, labeling, storing, distribution, transformation for further manufacturing of human blood collected for transfusion. The regulations are referenced to the most current version of the CSA Standard for Blood and Blood Components (Z902).

Hospital transfusion services must comply with these regulations. There is no specific reference to a Transfusion Committee either within the regulations or the accompanying guidance document.

[Guidance Document Blood Regulations Health Canada 2014-10-23](#)

Institute for Quality Management in Healthcare (IQMH), Accreditation Requirements

IQMH, formerly known as Ontario Laboratory Accreditation (OLA) has been in operation since September 15, 2000. Its first accreditation certificates were issued in 2003.

IQMH is mandated to perform regular external peer assessments of all licensed laboratories in Ontario and is linked to the Standards Council of Canada, so organizations may request an ISO 15189 accreditation certificate to be issued by the Council.

IQMH accreditation requirements that apply to Transfusion Committees include:

Requirement II.D.1: Laboratory management shall ensure that the laboratory participates in quality improvement activities. Some of these activities shall include clients and they shall deal with outcomes of patient care when possible.

TM182: There shall be a transfusion medicine committee with documented terms of reference. It shall meet at least quarterly and document its activities.

Institute for Quality Management in Healthcare (IQMH); Toronto, Ontario v 7.1 April 2017.

Appendix C: Example of Terms of Reference of a Transfusion Committee

<Hospital Name> Transfusion Committee

Terms of Reference

1.0 OVERVIEW

Each hospital in Ontario is required to have a Transfusion Committee¹,² with documented terms of reference. The committee shall review policies and activities to ensure that blood utilized in that facility occurs safely and effectively. The Transfusion Committee functions can be accomplished through another existing committee (such as pharmacy and therapeutics committee). The Transfusion Committee can function as a regional committee.

2.0 MANDATE

The mandate of the committee is to provide consultative and support services with relation to transfusion practices and activities. The purpose of the committee is to:

- ❖ Help define blood transfusion policies as appropriate to local clinical activities
- ❖ Ensure that regular evaluations of blood transfusion practices are conducted
- ❖ Set criteria for the evaluation of ordering practices, usage (including wastage/discards) and administration policies
- ❖ Ensure the transfusion service and clinical team are able to meet the needs of recipients
- ❖ Recommend corrective action/measures as required
- ❖ Disseminate information and education related to blood transfusion
- ❖ Evaluate reports of adverse transfusion events and errors within the facility, as well as relevant reports from other jurisdictions (provincial, national)
- ❖ Review available alternatives to allogeneic blood transfusion and make recommendations on their use
- ❖ Review transfusion audit findings and make recommendations

3.0 ACCOUNTABILITY

The Transfusion Committee should report to the Medical Advisory Committee <or similar committee>

4.0 MEMBERSHIP

The Transfusion Committee is required to involve key physician and nurses involved in the use of blood for transfusion, transfusion service staff and executive management.

¹ Canadian Standards Association CAN/CSA Z902-15 A National Standard for Blood and Blood Components. Standards Council of Canada, Mississauga, Ontario; December 2015: 4.4.

² Institute for Quality Management in Healthcare (IQMH), Toronto, Ontario; v7.1 April 2017: II.D.1 TM 182.

The medical director responsible for the transfusion service must attend Transfusion Committee meetings. If unable to attend, a designate can be sent in their place but this designate must be a physician.

The Transfusion Committee must have a chairperson named and this person should ideally not be the medical director responsible for the transfusion service.

5.0 TERMS OF MEMBERSHIP

Each member of the committee shall have a term of <insert length of term> years with an option to renew at the end of each term. Rotation of terms should occur to ensure new members can gain experience from those that have participated on the committee for at least two years.

6.0 MEETING FREQUENCY

Meetings of the Transfusion Committee must occur at least quarterly.

6.1 Meetings

6.1.1 The Chair will be selected by the Medical Advisory Committee

6.1.2 The Vice Chair will be selected by the Transfusion Committee members (by vote) and be approved by the Medical Advisory Committee

6.1.3 The Vice Chair will take the role of the Chair when the Chair is not present

6.1.4 A secretary will be appointed to record and distribute minutes of meetings, decisions and recommendations

6.2 Review of Terms of Reference

6.2.1 The committee shall review the terms of reference at least every 2 years.

7.0 CONFIDENTIALITY AND CONFLICT OF INTEREST

In the participation on the Transfusion Committee, members may have access to information of a confidential nature. Members must not disclose confidential information obtained during the course of their role in the Transfusion Committee and must take all reasonable steps to avoid and declare at any time, any conflict of interest.

Agenda (Example 1)

Meeting called by:	
Date & Time:	
Meeting Location:	
Participants:	
Adhoc:	

Transfusion Committee			
Agenda Item	Desired Outcomes	Person Responsible	Time Allotted
1. Acceptance of Agenda	Approval		2 min.
2. Minutes of Previous Meeting	Approval		2 min.
3. New Product Presentation (Fibrinogen Concentrate)	Presentation		10 min.
4. Review of Policies:	Review		10 min.
5. Business arising from minutes: a) Informed consent audit b) Massive Transfusion Protocol c) Contingency planning	Update		10 min.
6. New Business a) Bedside Audit b) Revision of Guidelines for Frozen Plasma use	Discussion		10 min.
7. Round Table Discussion	Additional items		5 min.
8. Reports: a) Blood Adverse Reaction report b) CBS Hospital Disposition Reports	Review		10 min.
9. Date of Next Meeting			
10. Adjournment			

Agenda (Example 2)

Meeting:	Regional Transfusion Committee	Date:	
Location:	Conference Room xxx/Teleconference #	Time:	0730-0900
Invitees	Representatives from each regional site		
	Agenda Item	Participants and Discussion Topics	
1.	Welcome, review of past minutes and current agenda	<ul style="list-style-type: none"> Attendance Review outstanding actions items Call for agenda items 	
2.	Review outstanding action items	<ul style="list-style-type: none"> Consent to transfusion policy and associated MD memo Pre-printed order sheet for blood transfusion Pediatric transfusion policies Issuing of Blood Products by RNs after hours 	
3.	New business	<ul style="list-style-type: none"> Guidelines for Appropriate Use of Blood Products Development of Massive Hemorrhage Protocol (MHP) using provincial toolkit Report from IQMH assessments within region 	
4.	Incident reports and acute transfusion reactions	Presentation of reported adverse reactions since last meeting Discussion of trends/action required	
5.	Report from CBS and ORBCON	Update on new processes or resources	
6.	Report from Hospital Sites	Site specific issues - discussion	
7.	Adjournment		

Conflict of Interest Guidelines

Definition

Conflict of Interest – any personal financial or other interest which conflicts with the role the individual because it could:

1. Interfere with the individual’s objectivity
2. Be perceived to create unfair advantage for the individual

Purpose

To provide guidance to members of this committee to identify and address situations that may arise when an individual is in conflict with their professional, business, volunteer or personal interests. These guidelines serve to preserve the integrity of decisions made by this committee to ensure they serve the best interests of the committee and the organization it serves.

Procedure

If a committee member feels they are in conflict of interest, they must declare it and recuse themselves from the discussion/decision. This shall be documented in the meeting minutes. Examples of situations include:

- At the time of appointment to the committee
- Prior to each meeting upon review of agenda
- During the course of discussion at a committee meeting

If a committee member fails to declare their conflict of interest they may be asked to step down from the committee.

A conflict of interest is any situation where your decision or opinion could be influenced by:

- a. your personal interest, or
- b. those of a close friend, family members, business associate, corporation or partnership in which you hold a significant interest, or a person to whom you owe an obligation

Conflict of interest arises when a reasonably well informed person could perceive that a decision was made or advice was given that would promote your personal interests or those you have some relationship with as listed above.

If you feel you have a conflict of interest at any time, you must disclose this to the chairperson of the committee and ask to be excused from the discussion / decision. If you are not aware of any conflict until after the discussion or decision has been made, you are still required to disclose your conflict immediately. Some committees require a conflict of interest form be signed. Alternatively, the disclosure of conflict of interest can be added as a standing agenda item and recorded in the committee meeting minutes.

Examples:

- Financial interest in or gifts received from a pharmaceutical company that manufactures blood products
- Research interest from a blood manufacturer (consulting fees, patents, royalties)

Reference: <https://www.councilofnonprofits.org/tools-resources/conflict-of-interest>

Appendix F: Example of a TSO Job Description

This generic job description illustrates the expectation in each area of responsibility of a TSO.

JOB FACTSHEET FOR TRANSFUSION SAFETY OFFICER

Technical/Clinical

- Reviews and investigates transfusion reactions and completes internal and external reports
- Identifies and investigates any trends related to transfusion practices
- Acts as a resource for blood transfusion related technical problems
- Liaises with Canadian Blood Services, commercial companies and Regulatory bodies
- Consults with clinical services regarding program changes that will affect blood product use
- Reviews, recommends and/or introduces blood transfusion equipment and devices
- Reviews published guidelines, standards, and literature on blood product use, blood transfusion
- Reviews alternatives to transfusion and makes applicable recommendations
- Liaises with Transfusion Medicine Laboratories (TML) TSOs from other healthcare institutions
- Oversees lookbacks, tracebacks and patient inquiries regarding blood transfusions

Utilization Management

- Collaborates with medical, technical, paramedical and nursing personnel to identify, implement and evaluate strategies for blood management utilization improvements.
- Conducts prospective and retrospective audits on the utilization of blood, blood products and their alternatives.
- Monitors Transfusion Medicine product utilization and brings utilization issues to the attention of the Medical Director and the Transfusion Committee.
- Maintains blood usage statistics.
- Develops and monitors a blood product utilization program to ensure that appropriate products and volumes are requested and used and that wastage is minimal.
- Develops and maintains a resource library for blood transfusion and educational material.

Quality and Risk Activities

- Participates in the investigation of errors and accidents and reports to Manager, Medical Director and Transfusion Committee. Recommends changes to practice where appropriate.
- Promotes benchmarking and evidence-based practice in the transfusion of the appropriate blood, blood products and their alternatives.
- Works collaboratively with the Manager, Technical Specialist, and TML staff to ensure updating of policy and procedure manuals to reflect changes in transfusion practice.
- Works collaboratively with Patient Quality and Risk Management, Critical Care Patient Safety Coordinator (or similar positions) to identify transfusion issues relating to patient safety, identify strategies on reducing product wastage as well as providing education on transfusion.
- Participates as a member on committees requiring Transfusion Medicine input such as new product evaluation and nursing procedures.

Professional and Educational Activities

- Provides education to physicians, residents, technologists, paramedical, nursing personnel and patients on appropriate use of blood, blood products and their alternatives, blood transfusion devices and other related information.

- Assists in planning educational symposiums on transfusion related topics.
- Develops and maintains a personal education program that supports continuing improvement in the role of Transfusion Safety Officer.
- Maintains a proactive involvement in professional organizations.
- Fosters a regional focus through planning and education on transfusion related issues.
- Acts as a resource to nurses, clinicians and staff related to Transfusion Medicine issues.
- Liaises with other paramedical organizations to ensure implementation of best practices in transfusion therapy (i.e. Ontario PeriAnesthesia Nurses Association (OPANA), IV Nurses Association, Transfusion Committee.).

Research

- Participates in transfusion related research.
- Participates and assists in the preparation of scientific papers for publication and/or presentation at scientific meetings on transfusion related matters.
- Liaises with clinicians, researchers and company representatives to identify research priorities.

Source: ORBCoN Transfusion Safety Officer Manual October 2017

<http://transfusionontario.org/en/documents/?cat=transfusion-safety-officer-resource-manual>



Maximum Surgical Blood Orders Guidelines

These are standard orders for procedures with the potential for blood transfusion. Procedures not listed have low likelihood for transfusion. The attending surgeon may upgrade the order when increased blood needs are likely.

Group & Reserve / Type & Screen include a blood group, antibody screen, and storage of patient plasma for the day of surgery. Compatible product will be added on quickly as needed.

For procedures with likelihood of transfusion, **packed red cells** may be ordered prior to OR. **Orders for other blood products must be communicated directly to Transfusion Medicine/Blood Bank ASAP.**

Informed written consent for blood products is required and is the responsibility of the surgeon.

Procedure	GR / T&S	Packed Red Cells
ABDOMINAL		
Abdomino-perineal Resection	X	2 units
Bowel / Rectum Resection / Hemicolectomy	X	
Common Bile Duct Exploration	X	
Esophagectomy / Esophogastrectomy	X	2 units
Gastrectomy	X	2 units
Liver Lobectomy / Resection	X	4 units
Pancreatectomy	X	4 units
Splenectomy – laparoscopic / open	X	2 units
Whipples Procedure	X	4 units
CARDIAC		
Aortic Coronary Bypass / Valve	X	2 units
Redo Procedure	X	4 units
GYNECOLOGY / OBSTETRICS		
Caesarian Section	X	
Hysterectomy / Oophorectomy / Myomectomy	X	
Laparotomy / Anterior-Posterior Repair / Sling	X	
Omentectomy procedures / De bulking	X	2 units
Therapeutic / Incomplete Abortion / Miscarriage	OBMOM/ RIGW	
NEUROSURGICAL		
Carotid Endarterectomy	X	
Clipping Aneurysm	X	2 units
Craniotomy	X	
Lumbar Laminectomy	X	
Meningioma	X	
Trans-sphenoidal	X	
ORTHOPEDIC		
Amputation	X	
Laminectomy	X	
Fractured Hip / Open Reduction	X	

Spinal Decompression - Instrumentation	X	
Total Joint Replacement (i.e. hip, knee, shoulder)	X	
OTOLARYNGOLOGICAL / MAXILLIOFACIAL		
Commando	X	2 units
Laryngectomy	X	2 units
Leforte Osteotomy - BSSRO	X	
Mastoidectomy / Parotidectomy / Thyroidectomy	X	
Modified / Radical Neck Dissection	X	2 units
PLASTIC SURGERY		
Head or Neck Surgery	X	
Mammoplasty	X	
THORACIC		
Lobectomy / Pneumectomy	X	2 units
Mediastinoscopy	X	
Resection – Mediastinal Mass / Chest Wall Mass	X	2 units
Thoracotomy / Thoracoscopy	X	
Wedge Resection of Lung	X	
UROLOGY		
Cystectomy / Ileal Conduit	X	
Nephrectomy	X	
Nephrolithotomy (Anatropic) / Nephrolithotripsy	X	
Prostatectomy - TURP / Retropubic	X	
Retroperitoneal Lymph Node Dissection (Radical)	X	
VASCULAR		
Abdominal Aneurysm	X	4 units
Amputation	X	
Aorto-femoral Bypass	X	2 units
Arterial Bypass	X	2 units
Fem-pop Bypass	X	
Peripheral Shunt / Bypass	X	
Profundoplasty	X	
Endo-vascular Aortic Repair	X	

Ver 1.0 Dec 2015

London Health Sciences Pre-Op Ordering Guidelines

ADULT PRE-OPERATIVE INVESTIGATIONS ORDER GUIDELINE London Health Sciences Centre St. Joseph's Health Care, London September 2015	Low risk patient Exercise tolerance > flight stairs or > 1 city block Age under 70 <u>Absence of known:</u> <ul style="list-style-type: none"> • Active malignancy • Heart disease • Pulmonary disease • Hepatic/Renal disease • Hematologic disorder <u>May have:</u> <ul style="list-style-type: none"> • Hypertension • GERD 	Intermediate risk patient Exercise > 1 flight stairs or > 1 city block Age of 70 ♥ History of angina/MI/atrial fib. ♥ Compensated heart failure ♥ Cerebrovascular disease ♥ Diabetes mellitus on oral hypoglycemic meds ♥ Renal insufficiency: Cr > 170 ♥ Respiratory disease / COPD ♥ Chronic steroid therapy ♥ Chronic anticoagulant	High risk patient Exercise < 1 flight stairs or < 1 city block ♥ Unstable coronary syndrome ♥ Decompensated heart failure ♥ Significant arrhythmias (Pulse > 100 or < 50) ♥ Severe heart valve disease • Severe COPD • Severe liver disease / cirrhosis (ascites, platelets < 160, jaundice) • Dialysis – dependent renal disease • Diabetes mellitus on insulin
Low risk surgery <i>Ambulatory</i> <ul style="list-style-type: none"> • Lithotripsy • Hernia/cholecystectomy • Arthroscopy <i>Endoscopic:</i> Gyne, Uro, GI <i>Ortho:</i> Minor joint / peripheral, scopes <i>Superficial:</i> biopsy, skin, tonsils <i>Plastic:</i> breast	<input type="checkbox"/> None	<input type="checkbox"/> CBC <input type="checkbox"/> Electrolytes <input type="checkbox"/> Creatinine of diabetic or renal insufficiency	<input type="checkbox"/> CBC <input type="checkbox"/> Electrolytes <input type="checkbox"/> Creatinine <input type="checkbox"/> INR if liver disease <input type="checkbox"/> ECG
Intermediate risk surgery <i>Orthopedic:</i> Spine, major joint Head and neck surgery Carotid endarterectomy Intraperitoneal (laparoscopy) Intrathoracic (VATS) Prostate	<input type="checkbox"/> None	<input type="checkbox"/> CBC <input type="checkbox"/> Electrolytes <input type="checkbox"/> Creatinine <input type="checkbox"/> Group & Screen <input type="checkbox"/> ECG if non within 1 month of screening appointment	<input type="checkbox"/> CBC <input type="checkbox"/> Electrolytes <input type="checkbox"/> Creatinine <input type="checkbox"/> INR if liver disease <input type="checkbox"/> Group & Screen <input type="checkbox"/> ECG
High risk surgery <i>Vascular:</i> Aortic, major vessels, Peripheral arteries Open intraperitoneal (laparotomy) Open thoracotomy Cardiac / Neurosurgery	<input type="checkbox"/> CBC <input type="checkbox"/> Electrolytes <input type="checkbox"/> Creatinine <input type="checkbox"/> Group & Screen	<input type="checkbox"/> CBC <input type="checkbox"/> Electrolytes <input type="checkbox"/> Creatinine <input type="checkbox"/> Group & Screen <input type="checkbox"/> ECG if non within 1 month	<input type="checkbox"/> CBC <input type="checkbox"/> Electrolytes <input type="checkbox"/> Creatinine <input type="checkbox"/> INR if liver disease <input type="checkbox"/> Group & Screen <input type="checkbox"/> ECG
<input type="checkbox"/> Cataract Surgery (No investigations)	<input type="checkbox"/> Sickle cell screen Family Hx / Ethnic risk	<input type="checkbox"/> INR on a.m. of OR Warfarin therapy	<input type="checkbox"/> POC glucose on a.m. of OR Diabetic patients
<input type="checkbox"/> Dialysis patient: electrolytes on day of surgery, unless done after dialysis the day before.		<input type="checkbox"/> B-hCG Offered if may be pregnant	<input type="checkbox"/> ECG Methadone treatment

Sep. 22/15

Appendix I: Sample template for e-mail to ordering physician when red cell transfusion does not meet transfusion guidelines, per Laboratory values.

Subject: RBC Transfusion – Confidential Peer Review

Dear Dr. (name):

As you know, maintaining an adequate supply of blood continues to be a challenge across North America. The demand in Ontario continues to exceed the supply. The transfusion of blood products can also have an adverse effect on a recipient. One of your patients (patient name), (HFN/MRN), received (#) units of Red Blood Cells (RBCs) for transfusion on (date), despite a hemoglobin level of (hgb level) and (hgb level the day before, the day of, and the day after the transfusion). According to the laboratory data alone, this transfusion does not appear to meet the (hospital name) Transfusion Committee guidelines for the appropriate transfusion of RBCs (please see criteria below).

Would you please review this transfusion order and let us know the clinical indication for transfusion in this particular case? We are especially interested to learn if the patient was actively bleeding. You can send your reply to (name) at (email) or (phone number) or (address).

(Hospital name) Transfusion Committee is encouraging staff to carefully review the indications for transfusion in clinically stable patients. In addition, the Transfusion Committee is also encouraging staff not to order two units of RBCs when a single unit is likely to be sufficient.

Thank you for your assistance,
Physician's reviewer's name

On behalf of (hospital name) Transfusion Committee

Inc: -Facility Guidelines: Transfusion of Red Blood Cells
-CSTM List of TEN Things Physicians and Patients Should Question

References:

1. Saxena, Sunita (2013). The Transfusion Committee: Putting Patient Safety First. AABB Press. 2nd Ed. Bethesda.
2. Choosing Wisely Canada, CSTM List of TEN Things Physicians and Patients Should Question. <https://choosingwiselycanada.org/wp-content/uploads/2019/04/Transfusion-medicine2.pdf>

Appendix J: Example Transfusion Order Set

Blood Product Order Set Template: Red Blood Cells, Platelets, Frozen Plasma – Adult

<p>Allergies/Sensitivities <input type="checkbox"/> none known <input type="checkbox"/> yes (specify) _____</p> <p>Admitting Diagnosis: _____</p>
<p><input type="checkbox"/> informed consent completed as per institutional guidelines</p>
<p>Date of transfusion: <input type="checkbox"/> today <input type="checkbox"/> other (DD/MM/YYYY) _____ <input type="checkbox"/> STAT (call blood bank at XXXXX)</p>
<p>Pre-transfusion laboratory tests <input type="checkbox"/> group and screen Previous transfusion within 3 months <input type="checkbox"/> yes <input type="checkbox"/> no Previous pregnancy within 3 months <input type="checkbox"/> yes <input type="checkbox"/> no Previous transplant <input type="checkbox"/> yes <input type="checkbox"/> no</p>
<p><input type="checkbox"/> if no existing IV initiate IV 0.9% NaCl to keep vein open <input type="checkbox"/> discontinue peripheral IV after transfusion complete</p>
<p>Pre-transfusion medications <input type="checkbox"/> furosemide _____ mg po prior to transfusion or _____ mg IV prior to transfusion <input type="checkbox"/> _____</p>
<p><input type="checkbox"/> irradiated product required as per hospital guidelines , specify reason: _____</p>
<p><input type="checkbox"/> specially matched product required as per hospital guidelines , specify reason: _____</p>
<p>Red Blood Cells Pre-transfusion Hb: _____ g/L Indication: <input type="checkbox"/> low Hb <input type="checkbox"/> significant bleeding <input type="checkbox"/> symptomatic <input type="checkbox"/> other Transfuse _____ unit(s), each over _____ hours (e.g. 1 unit over 2-3 hours, maximum 4 hrs) Note: consider IV iron instead of red blood cells for patients with stable iron deficiency anemia</p>
<p>Platelets (1 buffy coat pool or apheresis unit =1 adult dose) Pre-transfusion platelet count: _____ x 10⁹/L Indication: <input type="checkbox"/> significant bleeding <input type="checkbox"/> invasive procedure/surgery <input type="checkbox"/> prophylactic (platelet count <10 x 10⁹/L) <input type="checkbox"/> Other, specify reason _____ Transfuse _____ dose(s), each over _____ hours (e.g. 1 dose over 1-2 hours maximum 4 hours)</p>
<p>Frozen Plasma (dose 15 mL/kg, = 3-4 units for an adult; each unit 250 mL) Weight (kg) _____ Pre-transfusion INR: _____ Indication: <input type="checkbox"/> significant bleeding <input type="checkbox"/> invasive procedure/surgery within 6 hours Reason for coagulopathy: <input type="checkbox"/> liver disease <input type="checkbox"/> other (specify) _____ Transfuse _____ units, each over _____ (e.g. each unit over 30 minutes to 2 hours, maximum 4 hours)</p>
<p>Post-transfusion laboratory tests, if indicated <input type="checkbox"/> _____</p>
<p>Prescriber name (print): _____ date: _____ time: _____</p>
<p>Prescriber signature: _____ Pager # _____</p>

Example taken from ORBCoN Transfusion Quality Improvement Plan Toolkit (2016).

