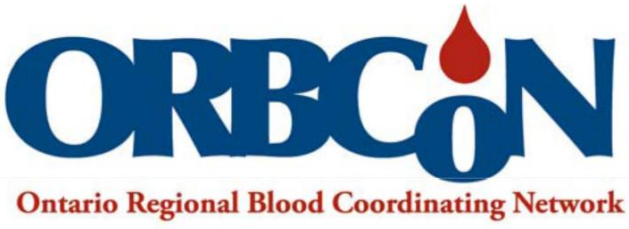
Transfusion Safety Officer Resource Manual



Inspiring and facilitating best transfusion practices in Ontario.

Preface

The Transfusion Safety Officer (TSO) Resource Manual was developed to be used as a reference for Medical Laboratory Technologists (MLT), Registered Nurses (RN) and other healthcare professionals appointed to the Transfusion Safety Officer role. This resource is also intended to be utilized by hospitals or institutions that do not have a formal TSO in place but have responsibilities that are delegated to certain healthcare personnel. The TSO's fundamental role is improving patient safety in all aspects of transfusion practice. There is no official guide to assist a healthcare professional's transition into the role of a TSO. The aim of this manual is to provide detailed information regarding the roles and responsibilities and the expected time commitments for those duties. Also included in this manual are education materials to support additional learning such as educational tools, algorithms, templates for blood product monographs, sample guides for equipment, glossary of terms and abbreviations commonly used, and much more.

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- Lakeridge Health
- London Health Sciences Centre
- St. Michael's Hospital
- Sunnybrook Health Sciences Centre
- Trillium Health Partners
- University Health Network

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- Laura Harrison, MLT ART Trillium Health Partners
- Kelly Syer, RN BScN Lakeridge Health
- Beverly Weaver, MLT Kingston General Hospital

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Example of a TSO Job Description

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

JOB FACT SHEET FOR TRANSFUSION SAFETY OFFICER [1]

Division or Department: Transfusion Medicine

Position Title: Transfusion Safety Officer

Technical/Clinical

- Reviews and investigates transfusion reactions, and completes internal and external reports as required.
- Identifies and investigates any trends related to transfusion practices, (i.e. an increased occurrence of reaction).
- Acts as a resource for blood transfusion related technical problems.
- Liaises with Canadian Blood Services, commercial companies and Transfusion Medicine regulatory bodies on transfusion related matters.
- Consults with clinical services regarding program changes that will affect blood product use, blood transfusion equipment needs, etc.
- Reviews, recommends and/or introduces blood transfusion equipment and devices to the appropriate hospital personnel.
- Reviews published guidelines, standards, and literature on blood product use, blood transfusion techniques, alternatives to transfusion and effects of transfusion and makes applicable recommendations.
- Liaises with Transfusion Medicine Laboratories (TML) and Safety Officers from other healthcare institutions.
- Oversees the completion of 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, etc.).

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.

TSO Time Commitments

TSOs are required to allocate their time across several areas of responsibility, as well as unexpected daily challenges. Questions may arise about the time commitment required. Based on information provided by TSOs, Figure 1 illustrates the time commitment for each of these areas. [2]

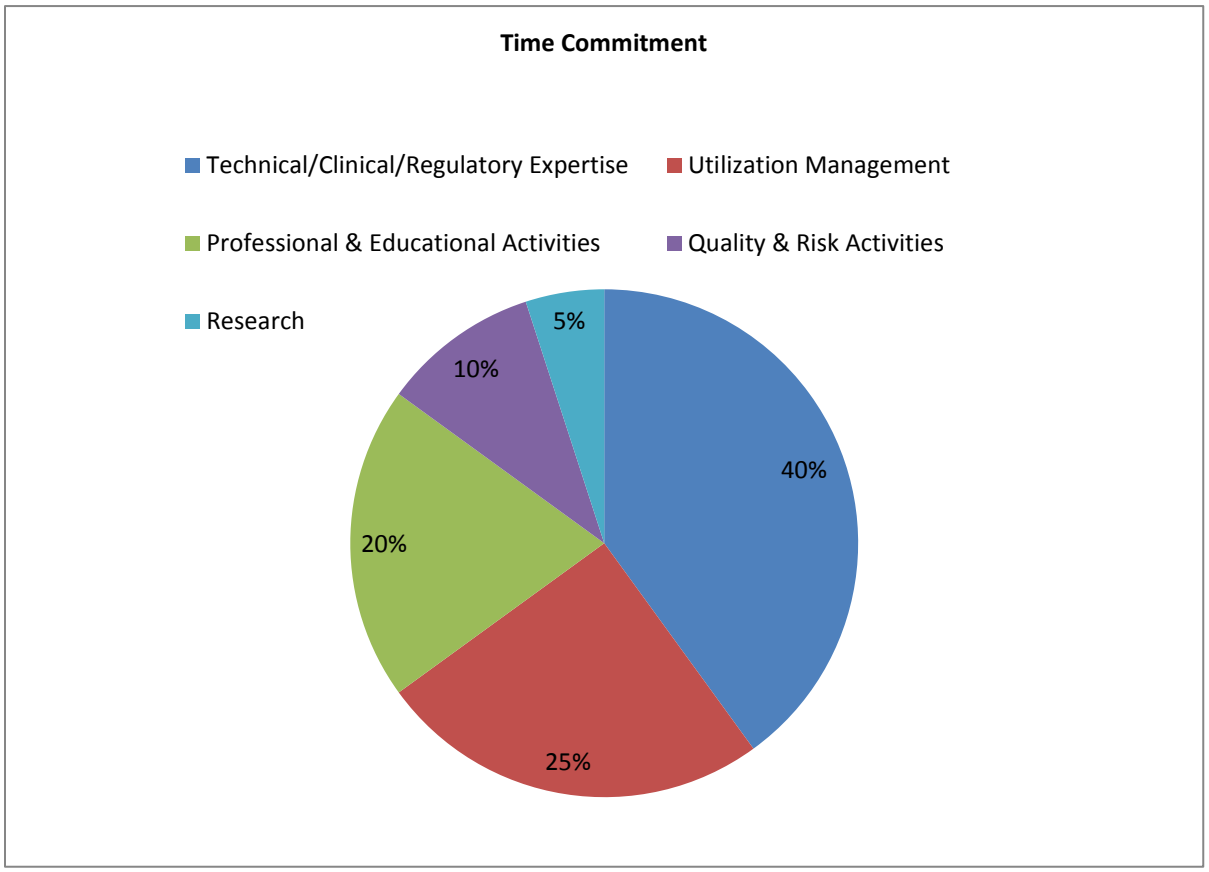

Figure 1: Time Commitment

Abbreviations & Glossary of Terms

A TSO may encounter unfamiliar language or terms related to his/her role based on having a clinical or laboratory background. The list below displays some of these terms or abbreviations:

Abbreviations

Associations/Organizations

AABB	American Association of Blood Banks
CBS	Canadian Blood Services
CSA	Canadian Standards Association
CSTM	Canadian Society for Transfusion Medicine
HQ	Héma-Québec
IQMH	Institute for Quality Management in Healthcare
ISMP	Institute for Safe Medication Practices
TC	Transfusion Committee
TTISS-ON	Ontario Transfusion Transmitted Injuries Surveillance System

Technical Abbreviations

Bili	Bilirubin
CBC	Complete Blood Count
Creat	Creatinine
Cryo	Cryoprecipitate
DAT	Direct Antiglobulin Test
FP	Frozen Plasma
G&S	Group and Screen
Hb or Hgb	Hemoglobin
Hct	Hematocrit
INR	International Normalized Ratio
IVIG	Intravenous Immune Globulin
LDH/LD	Lactate Dehydrogenase
Lytes	Electrolytes
PCC	Prothrombin Concentrate Complex
Plt	Platelets
PPP	Plasma Protein Products
aPTT	activated Partial Thromboplastin Time
RBC	Red Blood Cell
Retic	Reticulocyte
SAGM	Saline Adenine Glucose Mannitol (additive solution)
SCIG	Subcutaneous Immune Globulin
T&S	Type and Screen
Tx	Transfusion
WBC	White Blood Cell
XM	Crossmatch

Clinical Abbreviations

ABG	Arterial Blood Gas
ANH	Acute Normovolemic Hemodilution
BMT	Bone Marrow Transplant
BP	Blood Pressure
CMV	Cytomegalovirus
CXR	Chest X-Ray
C/O	Complaint Of
DAT	Diet As Tolerated
DIC	Disseminated Intravascular Coagulation
EF	Ejection Fraction
FiO2	Fraction of inspired O2
HgbAS	Sickle Cell Trait
HgbSβ-Thalassemia	Sickle Cell Beta -Thalassemia
HgbSC	Sickle Cell Hemoglobin Type C
HgbSS	Sickle Cell Disease
H/O or h/o	History Of
I/O	Input and Output
ITP	Idiopathic Thrombocytopenic Purpura or Immune Thrombocytopenia
JVP	Jugular Venous Pressure
JVD	Jugular Vein Distention
JW	Jehovah Witness
LOS	Length of Stay
MT	Massive Transfusion
MTP	Massive Transfusion Protocol
N/V	Nausea/Vomiting
PaO2	Partial Pressure O2 in Arterial Blood
PBM	Patient Blood Management
R/A	Reassess
R/F	Risk Factor
R/O	Rule Out
SCD	Sickle Cell Disease
SOB	Shortness of Breath
S/P or s/p	Status Post
S/S or s/s	Signs and Symptoms
TBSA	Total Body Surface Area
VS	Vital Signs
VTBI	Volume to Be Infused
WNL	Within Normal Limits

Transfusion Reaction Abbreviations

AHTR	Acute Hemolytic Transfusion Reaction
BACoN	Bacterial Contamination
FNHTR	Febrile Non-Hemolytic Transfusion Reaction
FNAIT	Fetal and Neonatal Alloimmune Thrombocytopenia
F/NAIT	Fetal/neonatal allo-immune thrombocytopenia

HDFN	Hemolytic Disease of the Fetus and Newborn
PTP	Post-Transfusion Purpura
TACO	Transfusion Associated Circulatory Overload
TAD	Transfusion-Associated Dyspnea
TA-GvHD	Transfusion-Associated Graft versus Host Disease
TRALI	Transfusion Related Acute Lung Injury
vCJD	Variant Creutzfeldt-Jakob Disease
WNV	West Nile Virus

* For Error-Prone Abbreviations, Symbols, and Dose Designations [3] refer to the link Error-Prone and for Dangerous Abbreviations, Symbols, and Dose Designations [4] refer to the link Do Not Use.

Glossary

Testing Definitions

Antibody screen is the use of at least two selective reagent red blood cells to detect clinically significant alloantibodies in the patient's serum or plasma. The term clinically significant refers to antibodies that can cause transfusion reactions or hemolytic disease of the fetus and newborn. This test takes 45-60 minutes to complete. For patients with new or known antibodies, testing will require a significantly longer time frame.

Crossmatch is a method used to determine red blood cell (RBC) compatibility between donor and recipient before a RBC transfusion. A crossmatch can be performed in a number of ways. [5]

> **Computer or Electronic Crossmatch** is a computerized system that is used in place of serological crossmatch to detect ABO blood group incompatibility prior to transfusion. This crossmatch takes about 5 minutes to complete, once the group and antibody screen has been completed, and is only used for patients without blood group alloantibodies. [5]
>
> **Immediate Spin Crossmatch** is testing that involves mixing of donor RBCs and recipient plasma/serum. This test takes about 10 minutes to complete once the group and antibody screen has been completed, and is only used for patients without blood group alloantibodies. [5]
>
> **Serological Crossmatch/Full Crossmatch** is testing that involves a more extensive method of mixing donor RBCs and recipient plasma/serum to determine compatibility for patients with blood group alloantibodies. This crossmatch takes 30-60 minutes to complete. [5] [6]

Platelet Antibodies are formed in response to exposure of transfused or fetal platelets or as an autoimmune response.

Blood & Blood Product Definitions

Apheresis is the process of removing a specific component from a person's blood during donation and returning the remaining components to the donor (e.g. apheresis platelets or apheresis plasma). [7]

Blood components are red blood cells (RBC), platelets, plasma, cryosupernatant plasma, and cryoprecipitate. RBCs are crossmatched; the other components are selected to be ABO compatible with the recipient. Plasma, cryosupernatant plasma, and cryoprecipitate need to be thawed before they are ready for transfusion. Cryoprecipitate may also require pooling. [6]

Blood Products are also known as product derivatives, plasma derivatives or plasma protein products (PPP). Blood products are prepared by fractionation of human plasma. These include intravenous immune globulin, albumin, and specific clotting factors and specific immune globulins. [6]

Solvent/Detergent Treated Plasma is prepared from a pool of plasma from many donors that undergoes treatment that significantly removes lipid-enveloped viruses such as human immunodeficiency virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV). [8]

Product Management Definitions

Lookback occurs when a blood donor is found to have a transfusion-transmissible infection. All previous donations from the donor are identified by CBS, and a notification is sent to hospitals who received the products. The attending medical staff of the recipients is notified in order to determine the recipient status and perform additional testing of the recipient. Results of the recipient are submitted to the blood supplier. [7]

Product Recall is "the removal from further distribution, or use, of a product (blood component) that violates legislation administered by Health Canada (a regulatory requirement)." [9]

Traceback occurs when a recipient is identified as having a transfusion transmissible infection. Hospitals are requested by CBS to search all records for evidence of transfusion and report all blood products that the recipient received. [7]

Withdrawal is "the voluntary removal by the manufacturer (blood supplier) of a product (blood component) that does not violate legislation administered by Health Canada." [9]

Memberships

Transfusion Medicine (TM) organizations and society memberships are recommended. Participation assists TSOs in networking with TM experts who will provide support through communication and education. Collaborating with other TM experts can provide a TSO with valuable insight and knowledge that will assist in promoting evidence based best practices.

AABB

AABB is an international association that focuses in the field of transfusion medicine and cellular therapies. The organization provides standards, recommendations and guidelines for transfusion medicine, cellular therapy, patient blood management, and quality management. [13]

Canadian Society for Transfusion Medicine (CSTM)

CSTM is an organization whose members are from various disciplines in the Canadian healthcare system. CSTM promotes best practices in Transfusion Medicine through education, communication, and partnerships. [11]

The benefits of being a CSTM member are: networking with Transfusion Medicine (TM) experts from various hospitals, CBS, Héma-Québec, and others involved in TM, gaining access to and receiving notification of recommendations and resources, reduced registration fees for the annual scientific conference. CSTM also provides Standards for Hospital Transfusion Services.

Canada's Transfusion Safety Officers

A website comprised of Transfusion Safety Officers and professionals from diverse, scientific, technical, nursing and medical backgrounds who are affiliated in all sectors of transfusion medicine in Canada. [12]

The website and mailing list aim to contribute to Canada's blood transfusion community by providing a system to:

- Store and share information and materials
- Discuss common concerns and issues
- Solve problems
- Promote e-learning opportunities

Hospital Transfusion Committee (TC)

TSOs are an integral member of the Transfusion Committee.
Mandate: [10]

- To ensure blood is ordered appropriately and administered safely
- To ensure wastage of blood components and products is minimized
- To review reports of adverse reactions, incidents and complaints and make recommendations for their prevention to improve patient safety
- To provide healthcare 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

The TSO performs audits and present data to the Hospital Transfusion Committee (TC) for review and discussion in order to develop recommendations to improve performance and prevent errors and incidences. For information on resources and tools available to support TC members, visit the Transfusion Committee Handbook V2.

Useful Links

- AABB
- BC Provincial Blood Coordinating Office
- Canada's Transfusion Safety Officers
- CBS
- CBS (educational references)
- CSTM
- National Advisory Committee on Blood and Blood Products
- Nova Scotia Provincial Blood Coordinating Program

Ontario Regional Blood Coordinating Network (ORBCoN)

ORBCoN is an initiative funded by the Ontario Ministry of Health and Long-Term Care (MOHLTC). It was created as a means to engage hospitals and CBS; coordinate educational initiatives to facilitate best transfusion practices and improve patient safety in Ontario; and assist with implementing the provincial Blood Utilization Strategy. Below are links to some of the resources developed through ORBCoN. [14]

Bloody Easy Blood Administration
Bloody Easy for Healthcare Professionals
IVIG
Home Infusion Toolkit
Resources for Midwives
Resource Manual for Medical Directors of Transfusion Medicine
Transfusion Committee Handbook
New Product Toolkit

Ontario Transfusion Coordinators (ONTraC)

The ONTraC program is a Patient Blood Management (PBM) or Blood Conservation Program (BCP). It is a provincial initiative that strives to improve transfusion practices by promoting alternatives to blood transfusion in surgical patients, enhancing patient care and well-being in a cost-effective approach. For information on algorithms and presentations, visit Education.

Ontario Transfusion Transmitted Injuries Surveillance System (TTISS-ON)

TTISS-ON is an important part of the National Hemovigilance System. It is a program developed for Ontario hospitals to report Adverse Transfusion Events (ATE). Below are links to documents that may assist during the investigation of a possible adverse transfusion event. Refer to the links for resources and forms.

Ontario Guide for Reporting Transfusion Reactions
Report an Adverse Transfusion Reaction
Transfusion Reaction Chart
Facts About Completing the CTAERF Form

Investigating a Possible Transfusion Reaction

TSOs are instrumental in gathering information on reported reactions to assist the TM Medical Director with final classification.

Transfusion reactions can vary in type and severity. Accordingly, the extent of the lab investigations and chart reviews following the report of a reaction will also vary in complexity. If possible, it is beneficial to interview clinicians present during the reaction as they can provide valuable information that may have been omitted in the patient record. The patient can also be a valuable resource, as he/she can help verify any relevant patient history or confirm any previous reactions.

As part of every ATE investigation, it is important to verify that a documentation or clerical check has been performed both on the patient (chart, product and armband) and laboratory sides (sample, testing and results). You are verifying that the right patient received the right product at the right time and dose.

Depending on the severity of a transfusion reaction, reporting to Canadian Blood Services (CBS), Health Canada or the manufacturer may be required. An online version of the Canadian Transfusion Adverse Event Reporting Form (CTAERF) is available. A login, which can be obtained from TTISS-ON, will be required in order to use the online form.

Where you may find the patient's charts

- Inpatients: Check chart at nursing station. This may be in paper or electronic form.
- Outpatients: The chart may be in clinic, in Health Records Department /Health Information Management, or scanned into electronic health record.
- Emergency Department (ER): The chart for discharged patients may be kept in ER for a day or two, before it is sent to the Health Record Department or Health Information Management.

Where you may find important information

Patient Chart

- Transfusion record should have the symptoms and vital signs during the transfusion.
- If the patient has had previous transfusions, check the vital signs before and during the previous units.
- Check vital signs 24 hours before the reaction and well after the reaction.
- Look for indications of fluid overload.
- Progress notes may provide more detail regarding the transfusion.

Initial Review

Review the vital signs and symptoms and identify if they are mild or severe. Confirm whether any symptoms had been occurring prior to the transfusion. The signs and symptoms experienced by the patient might not actually be the result of a transfusion reaction, if baseline vital signs and symptoms were consistent during and after the transfusion.

Refer to the Transfusion Reaction Chart TTISS-ON Transfusion Reaction Chart.

The patient may not be experiencing a transfusion reaction if:

- The patient was already experiencing fluid overload prior to the transfusion.
- The fever was present prior to the transfusion.
- There had already been a decrease or increase in BP.

- The patient was already on oxygen therapy.
- The patient is on a medication that could be the cause of the symptoms.

For a mild Febrile Non Hemolytic Transfusion Reaction (FNHTR) or mild allergic reaction confirm the absence of further symptoms and report as required at your hospital.

Further Investigation

The following information will be required if you need to enter the reaction into a Canadian Transfusion Adverse Event Reporting Form (CTAERF) and report to CBS or the product manufacturer. Refer to CTAERF (login required).

Physician Orders

- What was the indication for transfusion?
- What medications, tests, and procedures were ordered?
- Are there comments on the likely cause of symptoms?
- Was a specialist called in to assess the patient?
- Was the patient transferred to ICU?

Chart Information

- The chart will often give details of patient's status, symptoms, and treatment implemented at the time.
- Is the patient on antibiotics?
- Was the course of antibiotics changed in response to the reaction?
- What medications were given prior to the possible transfusion reaction?
- Was the patient given Tylenol (acetaminophen), Lasix (furosemide), and Benadryl (diphenhydramine) due to the reaction?
- Was diuretic drug ordered effective in increasing the fluid output?
- Review VS, jugular venous pressure (JVP) and ejection fraction (EF).
- Was a cardiology consult ordered?
- Was oxygen administered to the patient (may be documented as 1L, 2L, or 3L O_2)?
- Did the oxygen amount increase with the onset of the symptoms?
- Was the patient positioned in an upright sitting position? Fowler's position?
- What was the rate of infusion and what was the total amount of product administered?

Chest X-rays

- A CHEST or CHEST-PORTABLE X-ray may have been ordered on the patient. If the report is available, access the file for the results.

Other Lab Tests

- Look at the leukocyte count (WBC) and platelet (Plt) values in relation to the change in the level of hemoglobin (Hgb). It helps to discern if the patient's low Hgb after a transfusion of RBCs is due to hemolysis versus hemodilution. All three values (WBC, Plt, Hgb) are decreased following fluid resuscitation.
- Review hemoglobin (Hgb), reticulocyte count, bilirubin, lactate dehydrogenase (LD), spherocytosis, positive antibody screen, and a positive direct anti-globulin test (DAT) – for indication of hemolysis.
- Were blood cultures ordered?
- Previous positive cultures on file?
- Was the returned product forwarded to microbiology for culture and sensitivity?
- If a post transfusion sample was drawn, how does the appearance of the plasma compare with the pre-transfusion sample?
- Urinalysis: is there blood in the urine? Was this present in previous samples?

Consult Notes

- The physician may mention the reaction, the treatment, and/or thoughts about the cause.
- Physicians may suspect TRALI or TACO if patient has experienced dyspnea.

Possible Causes

- Follow the TTISS Transfusion Reaction Chart to assist in classification of the reaction.

TACO

- If the patient was administered Lasix and it was effective, provided with O_2, placed in Fowler's position, and the blood pressure increases, the reaction may be TACO.
- It is important to also consider the patient's cardiac history, age, fluid balance and the number of units transfused in sequence.

TRALI

- Sometimes this is hard to distinguish from TACO.
- Details about the reaction must be sent to CBS. CBS can assist in identifying this diagnosis. Note that special blood work is required for a TRALI work-up, therefore pay close attention to the collection and preparation of the specimen (requires freezing). In addition, a chest X-Ray result is required for the diagnosis.

Severe Allergic/Anaphylactoid

- Patient may present with skin reactions, respiratory problems, SOB, and hypotension.
- TRALI has been ruled out.
- This reaction will not display infiltrates on the chest x-ray.

Hemolytic [8]

- Common clinical presentations are fever and/or chills, N/V, pain, dyspnea, hypotension and/or tachycardia.
- Complications experienced by the patient include renal failure and disseminated intravascular coagulation.
- Hemolysis from IVIG and RBC transfusion is defined as a drop in Hgb of at least 10g/L, a positive DAT and 2 or more of the following: increased reticulocyte count, increased LD, low haptoglobin, hyperbilirubinemia, hemoglobinemia, or hemoglobinuria.
- Reaction type may be acute (less than 24hr) or delayed (greater than 24hr).

BaCon [8]

- Platelets are the component most susceptible to bacterial contamination due to storage at room temperature, but septic reactions associated with contaminated RBC units tend to be more severe. The predominant contaminants are gram-negative bacteria.
- Clinical symptoms often present during or up to 8 hours of the transfusion include fever, chills, hypotension/shock, DIC, and renal failure. Symptoms that are occasionally present are N/V and hemoglobinuria.
- Culture of unit is required.

IVIG Infusion

- Refer to IVIG Guide and Adverse Reaction Chart.

Hypotensive reactions [5][14]

- Clinically significant hypotension that does not seem to be related to another transfusion reaction type i.e. hemolytic, TRALI, etc.
- Thought to be associated with Angiotensin Converting Enzyme Inhibitor class of drugs (ACE inhibitors)
- May occur with the transfusion of any blood components, platelets more frequently, and PPPs, i.e. albumin

Reporting a Transfusion Reaction

TTISS-ON

Visit Ontario Guide for Reporting Transfusion Reactions for information on reporting a transfusion reaction.

Notification of Component Recall/Withdrawal

Notification of Component Recall/Withdrawal is the notification from CBS to request the status of a component or product issued to a hospital. Notification will include a request to quarantine, discard or return the specified component/ product.

In situations where the recalled product has already been transfused, a decision must be made with respect to recipient notification. The National Advisory Committee on Blood and Blood Products (NAC) has developed recommendations with respect to recipient notification.[15] The CBS Medical Director may also be consulted as necessary if more information is required regarding a blood component recall. If, following review, recipient notification is deemed necessary, it should occur as soon as possible so that any follow-up testing can be completed.

For more information on the NAC on Blood and Blood Products recommendations, visit Recommendations for the Notification of Recipients.

For information on CBS Plasma Product Recall, visit Patient Notification System.

Transfusion Reaction Investigation Templates

The following templates have been provided by Ontario hospitals to provide as examples or references for the development of your hospital's Transfusion Reaction Investigation Record.

Appendix 1

Patient: _____

Diagnosis: _____

Transfusion history/Pregnancy: _____

Symptoms: _____

Vitals: around time of reaction

Time								
Symptoms								
Temp								
BP								
Pulse								
Resp								
O2Sats								
O2 given?								

Other relevant Lab Results: retic, bili, LD, spherocytes,

Fluid Balance: was Lasix given?_____(Y/N) Effective? (Y/N)_____

Chest X rays: _____

Blood Cultures: _____

Progress Notes information: _____

_____

Conclusion:

Reaction Type: _____ Reviewed By: _____

Appendix 2

Chart Audit/Transfusion Reaction Investigation

Location: **MRN:** **Name:**

Date of transfusion: Time: Previous Transfusions: Yes No When:

Consent: Yes No Transfusion Record: Where located?

Order on chart/CPOE: Number of units: Time specified/Infusion rate:

Blood component/ Product Type: unit number:_____ Amount transfused:

Patient wearing ID: Legible:

IV established

Transfusion record stamped on both sides:

Signed by two HCP:

Time started:

Pre-Transfusion vital signs checked within 30 minutes prior to transfusion: Yes No

If not, specify Actual time: _____

Were vital signs checked 15 minutes after start of transfusion?

Multiple units given?

Symptoms: Start time Time Tx Rx resolved_____

Fever		Flushing		Nausea Vomiting	
Chills/rigors		Dyspnea/SOB		Anaphylaxis	
Urticaria (hives)		Wheezing		Diffuse Hemorrhage	
Rash		Hypotension		Jaundice	
Itching		Hypertension		Pain	

Treatment:

Antipyretic		Diuretics		O2 supplement	
Antihistamine		Analgesics			
Epinephrine		ICU transfer			
Steroid		Intubation/Ventilation			
Fluid		Antibiotics			

Comments /Notes:

Clinical Investigation Worksheet (For Transfusion Safety Nurse Only)

Last Name: _____ First Name: _____ M / F

Transfusion Date:		Transfusion Time:		Current Pt. Location:	

History:

Meds:

More than one blood component or blood product transfused? Yes / No Volume:_____

Unit Tx'd	Vital Signs	Time	Temp	BP	HR	RR	O_2 Sat	FIO_2	Comment
	Pre-Tx								
	15 min								
	End								

Comments:

Tests ordered (chart)				**Test results**	
○ Group and Screen	○	CBC	○ Blood Cultures	Hgb	Haptaglobin
○ DAT	○	Bili, LDH,	○ Urinalysis	LDH	Bili
○ Chest X-ray	○	aPTT, INR, fibrinogen	○ Plasma Hb	Retic	
	○	Blood Gases	○ Lytes, Creat		Fluid Balance

☐ Transfusion Reaction reviewed by TM Technical Specialist / Operations Leader
☐ Transfusion Reaction reviewed by Transfusion Safety Nurse
☐ Transfusion Reaction reviewed by TM Medical Director
☐ Transfusion Reaction reported in Soarian

If applicable:
Canada Vigilance form faxed to:
☐ *Health Canada*
☐ *Manufacturer*

MD CONCLUSION:			
Acute Hemolytic Transfusion Reaction	Delayed Serologic Transfusion Reaction	No Incompatibility Detected	Transfusion-Associated Circulatory Overload (TACO)
Anaphylactic Shock	Febrile-Non-Hemolytic Transfusion Reaction	NOT Transfusion Related	Transfusion-Associated Dyspnea
Aseptic Meningitis	Hypotensive Reaction	Other _____	Transfusion-Related Acute Lung Injury (TRALI)
Bacterial Contamination	IVIG	Post-Transfusion Purpura Thrombosis	Transfusion-Transmitted Infection
Delayed Hemolytic Transfusion Reaction	Major Allergic Reaction	Transfusion-Associate Graft-Versus-Host Disease	
	Minor Allergic Reaction		

Imputability: Definite Probable Possible Doubtful Ruled Out Grade: ☐ 1 ☐ 2 ☐ 3 ☐ 4

For Future Transfusion:	

FOR TM: Store with other TRANSFUSION REACTION documentation and copy of final report with conclusion

Appendix 3

MRN	
surname	
first name	
middle name	
sex	
ever gravid?	
# of pregnancies	
transfusion history	
transfusion reaction history	
DOB	
date of reaction	
age time of reaction (YEARS)	
date of admission	
past medical history	
reason for admission	
facility	
associated with transfer to ICU or any other escalation of care?	
date of discharge	
discharge: live or dead	
LOS (DAYS)	
days from reaction to death among fatal cases	
days from admission to reaction	
days from reaction to discharge among survivors	
previously known allergies	
chills/ rigors	
rash (% TBSA)	
dyspnea	
wheeze	

lip / tongue swelling	
pain (& where, if any)	
bleeding / oozing	
hematuria	
nausea or vomiting	
other	
TEMP (observed days up to reaction & immediate pre)	
TEMP (immediate post, & observed days afterward)	
high risk (HR) vs low risk (LR) fever or not applicable (NA)	
HR	
HR	
BP	
BP	
RR	
RR	
saO2	
saO2	
CXR	
CXR	
ABG (BEST OR MOST RECENT)	
ABG (WORST OR CLOSEST)	
cardioresp or volume parameters pre	
cardioresp or volume parameters post	
PRODUCT(s)	
administered via (which vascular access)	
CMV status of patient	
SPECIAL PRODUCT ATTRIBUTES	
AGE OF UNIT	

PRE-MEDICATION	
TIME STARTED	
TIME COMPLETED	
TIME AT REACTION	
POST-MEDICATION	
PROPORTION OF PRODUCT TRANSFUSED	
mode of crossmatching	
PRODUCT ABO type	
other donor antigens of relevance (Ag+ / units tested / units given)	
other donor antibodies of relevance (or donor sex)	
patient pre-transfusion DAT	
patient post-transfusion DAT	
evaluate, if +	
patient pre-transfusion screen	
patient post-transfusion screen	
patient pre-transfusion ABO type	
patient post-transfusion ABO type	
other relevant antigen typing information on patient	
hemolytic parameter changes pre/post (if any)	
anti-leukocyte antibodies found in case (HLA: PRA)	
patient cultures before transfusion (most recent negative or active positives)	
pre-transfusion antibiotics	
culture of product	
post-transfusion antibiotics	
patient cultures after transfusion (soonest positive or negative if so)	
co-component or donor lookback findings	
preceding ANC / WBC & shifts (decreases or	

increases) afterwards	
pre-transfusion abnormality for which blood was indicated (triggering value & symptoms)	
was this a preventable event by following HTC guidelines?	
error/incident	
who ordered the blood (& credentials) (eg. resident MD, NP, MRP)	
probability	
diagnosis	
probability	
diagnosis	
probability	
diagnosis	
probability	
diagnosis	
probability	
diagnosis	
imputability/relationship of product(s) to disturbance	
grade/severity of disturbance	
Outcome	

Appendix 4

TRANSFUSION REACTION INVESTIGATION
PATIENT/PRODUCT INFORMATION

3. *Review TRAC report, ensuring completeness.*
4. *Using PPI, record implicated unit in designated area on this form*
5. *Follow TRAC Laboratory Management Poster to perform investigation, where required*
6. *Attach TRAC report to TRI form; forward to TSO or designate.*

Unit/lot# implicated in Transfusion Reaction:	

UNIT CHECK (R125) Complete if unit is returned to BTL					
	Y	N	N/A	Date	Initial
1. Condition of unit, please describe:					
2. Color of unit, please describe:					
3. Cerner label and blood product information agree?					
4. Have associated products been place in quarantine?					
5. If sepsis suspected, has unit been sent to Micro? (refer to R128)					

FULL TRANSFUSION REACTION INVESTIGATION (R127) Complete if post-tx specimen is rec'd

Record Pre results for ORV. Pre and Post results must be repeated in parallel if any part of the Post investigation is abnormal or different from initial Pre results…..GO TO PARALLEL TESTING SECTION.

	Samples	**Accession#**	**Date/time Drawn**	**Plasma Colour**	**Label info OK?**	**ABO/Rh**	**DAT**	**Ab Screen**	
	Pre								
	Post								

PARALLEL RETESTING

Consult with TSO, Coordinator or designate immediately to determine the scope of parallel testing required.

	Samples	**Accession#**	**ABO/Rh**	**DAT**	**Ab Screen**	**AB ID**	**Tech:**		
	Pre								
	Post								

Life threatening reaction, notify Medical Director/Hematology Consultant on call.
Person Notified: Date/Time Tech:

SECTION COMPLETED BY TSO/designate:

***Admission Diagnosis**:*

Date/Time Report Rec'd by TSO/designate:

Type of Reaction:

Recommendation:

Febrile:	**Y**	**N**	**Comment**
Fever 24 hr prior			
Febrile Neutropenia			
Pre-transfusion Medications			
Blood Cultures Collected			
Hemolytic Markers			

SOB:	**Y**	**N**	**Comment**
Additional vitals			
Chest Xray			
Echo			
Intubation			
Clinical Outcome			

Allergic:	**Y**	**N**	**Comment**
Pre-transfusion Medications			
BP			
Clinical Outcome			
Degree			

Hypotensive	**Y**	**N**	**Comment**
ACE Inhibitors			
Allergy			
BP 24 hr prior			
Blood Cultures Collected			

Delayed Hemolytic	**Y**	**N**	**Comment**
Pre/Post Hemolytic Markers			
Antibody Screen ID			
DAT			
Clinical Data			

Reporting	**Y**	**N**	**Comment**
CBS Notified			
Drug Manufacturer Notified			
Patient comment added			
Health Canada Notified			
TRX resulted			
Chart report printed/checked			
Associated units releases from Quarantine			

Comments:

Reviewed By:
Date Reviewed:

Product Monographs

The following samples of product monograph templates are provided for your reference.

Appendix 5

Product Monograph:

CONSENT FOR TRANSFUSION IS REQUIRED UNLESS EMERGENCY TREATMENT CONDITIONS EXIST

CLASSIFICATION

INDICATIONS

AVAILABILITY

DOSAGE

RECONSTITUTION:

STABILITY

ADMINISTRATION

PRECAUTIONS

ADVERSE EFFECTS

NURSING IMPLICATIONS

This is a summarized version of the product monograph and should not replace the full document. For the most in-date instruction, please refer to the monograph issued with the product.

REFERENCES

Appendix 6

BLOOD PRODUCT MONOGRAPH	RED BLOOD CELLS
For complete information refer to ***Blood and Blood products - Ordering, Issuing and Administration of Blood and Blood Products Policy & Procedure*.**	
CONSENT FOR TRANSFUSION IS REQUIRED	

CLASSIFICATION: Blood component used to increase oxygen carrying capacity and improve tissue oxygenation.

AVAILABILITY:

- 1 unit per bag - Volume as indicated on manufacturer label – approximately 300 mL
- Reassess both hemoglobin and clinical status before requesting additional doses.

STABILITY:

Use immediately upon receipt. Contact Transfusion Laboratory (TL) if transfusion must be delayed. Complete or terminate transfusion within 4 hours from time of issue. If Red Blood Cells (RBC) will not be used, return to TL immediately.

PRECAUTIONS:

- Fatal hemolytic transfusion reactions can occur if a patient is transfused ABO incompatible blood.
- Label laboratory samples in the presence of the patient verifying the patient identification (including unique #) matches the sample label.

DOSAGE AND INDICATIONS:

Refer to *Transfusion Guidelines*. Needs for transfusion are based on these guidelines (for certain populations) as well as clinical status.

PREPARATION:

- Enter request into Meditech – Order Entry system under the module 'BB' for Blood Bank.
- Type and screen (T/S) must be in-date to be valid (collected within 28 days for most patients and 3 days for patient transfused or pregnant within the previous 3 months).
- Turn-around time for a T/S is approximately one hour but may be longer if antibodies are detected.
- RBC's (packed cells) can be viewed in the Patient Care Inquiry system as 'Ready'

ADMINISTRATION:

- Complete independent double check by two Regulated Health Care Professionals immediately prior to administering the blood transfusion. If any discrepancy exists, call the TL and DO NOT continue until the discrepancy can be resolved.
- Blood Set Intravenous tubing (Y-type) with 170-260 micron in-line filter.
- Compatible only with 0.9% sodium chloride.
- Change blood tubing after 2 units of the same type of component or 4 hours of use.
- IV access – 22G for slow non-urgent transfusions, CVAD, PICC or implanted ports. 16 – 18 G is required for rapid transfusions to prevent hemolysis of the Red Blood Cells.
- Dedicated intravenous site or lumen of a central line – no mixing with other IV solution or medications.
- Initiate transfusion slow (1 mL/kg to a maximum rate of 50 mL/hr) for the first 15 minutes to assess patient response.
- Red Blood Cells are typically transfused over 2 hours. Patients at risk of circulatory overload (i.e. cardiac or renal disease, elderly, chronic anemia) should be transfused slower with furosemide pre-transfusion.

ADVERSE EVENTS:

Report all suspected transfusion reactions to the TL; refer to the *Transfusion Reaction Investigation Policy and Procedure.*

NURSING IMPLICATIONS:

- Ensure consent is complete before sending for blood from TL.
- Check and document vital signs (temperature, heart rate, blood pressure, respiratory rate and oxygen saturation as follows:

Vital Sign Chart	
Adult Population	Neonates and Pediatrics Population
Baseline (within 30 minutes prior to initiating the transfusion)	Baseline
15 minutes after the blood product entering the vein	15 minutes after the blood product entering the vein
Hourly	Every 30 minutes
At the completion of the transfusion	At completion
	One hour post transfusion
Note: More frequent vital signs may be necessary for patients: who cannot communicate to staff, or are at risk for circulatory overload, or are experiencing a transfusion reaction.	

- Patients who will be discharged soon after being transfused must be provided with written instructions on what to do if a reaction is suspected.

Appendix 7

XXXXX Hospital/Health Centre

BLOOD PRODUCT ADMINISTRATION GUIDELINES (Monograph)

Blood Product Name: Cryosupernatant Plasma (CSP)	**Approved by: xxxxx**	**Page 1 of 3**
Other Names: • CSP • Cryo-poor plasma (CPP) • Plasma - cryoprecipitate reduced • Cryo-depleted plasma	**Date Approved: xxxxx** **Effective Date: xxxxxx**	**Document #: xxxxxx** **Version #: V 2**

Classification/Indications	CSP is prepared from slowly thawed Frozen Plasma (FP) that is centrifuged to separate the insoluble cryoprecipitate from the plasma portion. The remaining plasma is frozen. It is a source of plasma having reduced levels of von Willebrand Factor (vWF) and Factor VIII. It may be used for: • Replacement of multiple coagulation factors, except for Factor VIII and vWF • Treatment of Thrombotic Thrombocytopenia Purpura (TTP) • Treatment of Hemolytic Uremic Syndrome (HUS) • Bleeding patients on warfarin who require an invasive procedure before vitamin K can reverse the warfarin
Contraindications	Do not: • Use for consumptive coagulopathies (e.g. DIC) • Use for single coagulation factor deficiencies • Administer to patients with known anti-IgA antibodies • Use to treat hypovolemia • Use ABO incompatible plasma products
Supplied	The mean volume is 282 ± 37 mL (no less than 100 mL) Can be stored for 12 months at -18^{o}C or colder ABO of the blood donor is indicated on the bag label

Dosage	Depends on the clinical condition and size of the patient To augment the concentration of clotting factors: 10 - 15 mL/Kg For warfarin reversal: 5 – 8 mL/Kg Pediatric infusions: 10 – 20 mL/Kg
Reconstitution/Stability	Thawing process takes about 20 - 30 minutes Transfuse thawed product within 4 hours Thawed product can be stored at 1 – 6^{o}C for 24 hours in a monitored refrigerator

Blood Product Name: Cryosupernatant Plasma (CSP)	**Effective Date:**	**Page 2 of 3**
Compatibilities/ Incompatibilities	Only 0.9% sodium chloride is permitted to be added to this product or to be infused through the same tubing Compatible Red Blood Cells (RBCs), platelets and other blood components and 5% albumin may be added at the physician's discretion Do NOT add: • Medications/drugs • D5W (5% Dextrose in water) • Lactated Ringers or any other calcium containing solution	
Administration, **Identification and ABO Compatibility**	Positively identify, as per the policies and procedures, (before administration): • The potential recipient • The product order/dose • The product Verify that informed consent has been obtained	

	ABO Compatibility of Plasma Products **Patient ABO Group** — **Compatible Donor ABO** O — O, A, B, AB A — A, AB B — B, AB AB — AB Rh type is not a concern for plasma products
Administration, Method	**Infusion Rate-** Prescribed by the physician, but infusion times usually run from 30 to 120 minutes. Transfuse slowly where possible for the first 15 minutes (50 mL/hour) **Administration Set-** A standard blood administration set (170 – 260 microns) is used **Gravity, minibag, buretrol and infusion pumps-** Are all acceptable methods of infusion. Do not administer by IV push, IM or SC **Dilution-** Do not dilute this product **Monitoring-** Monitor the patient as per the policies and procedures, but minimum criteria are assessing vitals: • Before the transfusion • 15 minutes after commencement of transfusion • At the end of the transfusion • During any transfusion reactions

Blood Product Name: Cryosupernatant Plasma (CSP)	**Effective Date:**	**Page 3 of 3**

Adverse Events • **Stop the transfusion** • **Notify physician** • **Treat patient symptoms** • **Notify Transfusion Medicine** • **Follow the Transfusion Reaction/Adverse Event Policy**	Risk of transfusion reactions range from 1 in 20 for FNHTR with the administration of a pooled platelet product to 1 in 7,800,000 for transmission of HIV. A list of the most commonly described transfusion reactions is supplied below: 1. Allergic Reaction 2. Bacterial Contamination 3. Anaphylactic Reaction 4. Transfusion Associated Acute Lung Injury (TRALI) 5. Transfusion Associated Circulatory Overload (TACO) 6. Acute Hemolytic Transfusion Reaction 7. Febrile Non-Hemolytic Transfusion Reactions (FNHTR) 8. Hypotension (Bradykinin Mediated) 9. Delayed Hemolytic Transfusion Reactions 10. Post Transfusion Purpura 11. Transfusion-Related Alloimmune Thrombocytopenia 12. Other transfusion transmitted infections (virus, parasite and prion)

Examples of equipment used for a blood transfusion

Central Venous Catheter (CV) and Peripherally Inserted Central Catheter (PICC)

A peripheral intravenous line (PIV) may not always be easy to obtain on a patient. Transfusion can also be administered via their CV and PICC line.

Infusion pumps

These are sometimes used to control infusion rates. Some examples of these products are:

- Baxter SIGMA Spectrum Infusion Pump with Master Drug Library Sigma Pumps
- Alaris Signature Edition Infusion System Alaris Pump
- For more references on Alaris Pumps visit Infusion Resource Library

Rapid Infusion Devices and Blood Warming Devices

Sometimes the prescribing healthcare practitioner may request for external pressure devices to aid in rapid infusion of blood products and it may also be necessary to keep the patient warm during the transfusion. For example:

- Level 1H-1025 Fast Flow Fluid Warmer
- Hotline Blood and Fluid Warmer HL-90

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