

# Transfusion Camp Annual Report

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2021-2022



2022-10-07

# Table of contents

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Executive Summary	1
Program Overview	2
Registration and Attendance	4
Knowledge Gain Assessment	6
Program Assessment	8
International Partnerships	10
Transfusion Camp Dissemination	12
Contributing Partners	13
References	15
Appendix I: 2021-2022 Transfusion Camp program and schedule	i

## Executive Summary

Transfusion Camp is an education program that aims to increase transfusion knowledge and best practice by providing high-quality and relevant transfusion medicine (TM) training to Canadian postgraduate medical residents and their faculty members in various specialties related to transfusion. It has been recognized as a novel and scalable approach to delivering effective TM education.

Since 2016-2017, Transfusion Camp has trained >1,700 trainees. In 2019, our study demonstrated that Transfusion Camp increased knowledge, fostered positive attitude towards TM and enabled a self-reported positive impact on transfusion practice in postgraduate trainees.<sup>1</sup>

First established in 2012 as a TM education program for postgraduate trainees at the University of Toronto, Transfusion Camp is now a national program led by faculty at the University of Toronto QUEST Program. It is managed centrally by Canadian Blood Services and delivered nationally through the collaboration of transfusion experts, residency training program administrators and regional partner organizations. Transfusion Camp is also supporting TM education internationally through key partnerships.

### Curriculum key updates

- 16 hours of didactic lectures delivered by 17 faculties and supplemented by 13 hours of team-based learning seminars delivered by 38 local faculty members.
- The 5-day curriculum was delivered over a slightly shorter period of time (8 versus 9 months), and time between Days 1 and 2 and Days 2 and 3 were shortened following feedback received from trainees as well as the results of a qualitative study.
- The “Advanced Hemostasis Testing & Management” Seminar was expanded to include advanced hematology follow up questions to address a training need for hematology trainees.

### Program participation and impact highlights

- 377 trainees, representing 12 medical specialties from 15 Canadian universities participated in Transfusion Camp, including for the first time the University of Manitoba.
- Continued delivery of lectures and seminars virtually to accommodate social distancing measures necessitated by the ongoing COVID-19 pandemic.
- Continued positive impact of Transfusion Camp on Canadian trainees’ TM knowledge assessed via a validated test (Pre-Camp mean score 59% vs. Post-Camp mean score 77%).
- Continued positive impact of Transfusion Camp on Canadian trainees’ practice with the majority reporting applying their Transfusion Camp learning to their clinical practice ( $\geq$  65%).

### International partnerships

- Partnership with the U.K. expanded to include Guy's Hospital & St. Thomas' Hospital and University Hospitals Birmingham NHS Foundation Trust, bringing the total of U.K. sites to three (including the University of Oxford).
- Continued partnership with Australia (Australian Red Cross) to leverage Transfusion Camp content for educating physicians in this country.
- Partnership with Rwanda was established as a pilot for delivering Transfusion Camp in low-resource settings. A modified Day 1 curriculum was delivered in June 2022 to 28 postgraduate residents in Rwanda, supported by local TM experts, Dr. Teresa Skelton of the University of Toronto on site in Rwanda and Drs. Jacob Pendergrast and Yulia Lin, virtually from Toronto.

## Program Overview

### Program objective

Blood transfusion is the most common procedure administered in hospitalized patients and is prescribed by physicians of almost every specialty.<sup>2,3</sup> Despite advances in recent decades, transfusion remains an intervention associated with risk. Expert panels have recommended strategies to reduce mortality and morbidity related to transfusion, including adherence to evidence-based transfusion guidelines and increased transfusion medicine (TM) education.<sup>4</sup> One of the challenges in delivering TM education is determining the optimal time in training to deliver such content. Recent reviews advocate for TM education at the beginning of clinical training, either in medical school or early in the postgraduate training period, so as to tailor to the specialty.<sup>5-7</sup> However, several studies have shown that TM knowledge at this level is deficient.<sup>8-13</sup> Additional challenges include reaching trainees in multiple specialties, and limited faculty to deliver TM education.

In response to these needs and challenges, **Transfusion Camp was developed with the vision that medical residents across Canada have access to up-to-date transfusion knowledge and effective educational methodologies.** Established at the University of Toronto in 2012, Transfusion Camp is now national and includes international partners.

### Program content and delivery

The Transfusion Camp Planning Committee is responsible for determining the program learning objectives and developing the program curriculum to meet these objectives. The Committee meets after each session to review participant feedback, changes in transfusion practice, and to modify the program accordingly.

The main learning objectives for 2021-22 were: **Indications for blood products, Blood bank testing, Risks of transfusion, Indications for manufactured blood products, Special transfusion situations, and Blood conservation.** Participants were provided with 26 pre-reading materials and 5 additional reference materials, received a total of 16 hours of didactic lectures and actively participated in 13 hours of team-based learning seminars. The lectures

and seminars were delivered “live” on September 17, November 19, January 21, March 25, and May 13. See Appendix I for full details on the program, faculties, planning committee members, partners, and collaborators.

Lectures were prepared and delivered by 17 faculties. All lectures were updated. New faculty were invited to present. Dr. **Waseem Anani** of Canadian Blood Services joined the faculty for the Day 2 Delayed Non-Infectious Reactions lecture. Dr. **Natasha Rupani** of the University of Toronto joined the Transfusion Camp faculty to deliver the Day 4 Congenital Coag – VWD, Hemophilia lecture. Dr. **Carolyn Elbaz** of McGill University joined the Transfusion Camp faculty to deliver the Day 4 Reversal of antiplatelets & direct anticoagulants lecture. Dr. **Eric Tseng** of Unity Health joined the faculty to develop and expand The Advanced Hemostasis Testing & Management seminar to include more advanced hematology follow-up questions and cases.

Team-based learning seminars, developed by faculty in Toronto, consisting of relevant case studies were led by 38 local TM experts with supporting materials provided by the program. The seminar questions were translated into French by Héma-Québec to make the content more accessible to French-speaking trainees.

In response to the continuing COVID-19 pandemic, Transfusion Camp continued in an entirely virtual format. Lectures were delivered live remotely by faculty via webinar. Trainees joined the virtual meeting individually to view the lectures and followed with group seminars led with local faculty. In response to feedback from the previous years, the virtual seminar breakout rooms were coordinated and administered centrally for the majority of sites participating “live”. For Day 4 seminar on Advanced Hemostasis & Testing, seminars were separated by specialty into Hematology and non-Hematology groups at the University of Toronto which much positive feedback. In addition, hematology trainees from Queen’s joined the University of Toronto hematology seminar group.

Video recordings of the lectures were made available to all participants, including sites which access materials post “live” (i.e. University of Alberta and University of British Columbia). At these sites, trainees viewed the recorded lectures as either a group or individually, followed by seminars led by local TM experts.

To facilitate the virtual seminars, a “Guide for Delivering Seminars” was provided to assist faculty in moderating a seminar. A second guide was provided to the trainees to participate in the seminars more effectively.

## Program evaluation

Trainees completed a TM knowledge assessment at the start of Day 1 and at the end of Day 5. The tests were administered electronically via SurveyMonkey. This allows for all registered trainees to complete the tests, irrespective of whether or not they attend the day on which the surveys are distributed.

A link to an anonymous post-event online SurveyMonkey survey was sent to all trainees registered in the program after each of the completed Transfusion Camp Days.

## Program support

A coordinating office located within Canadian Blood Services provides support for delivering the program on a national and international scale. These tasks include managing Camp registration and attendance; collecting and analyzing trainee feedback; and recruitment and onboarding of prospective participating universities. The coordinating office also manages resources required to deliver the Camp, including a **collaborative online sharing platform** (Microsoft SharePoint) where all program related materials for faculties and local program administrators are housed and can be accessed throughout the year; **webinar technology** (Zoom Meeting) to broadcast and record the lectures, record attendance and provide breakout rooms for the virtual seminars; **video editing capabilities** (Adobe Premiere Pro); a password protected **online course portal** to facilitate access of Transfusion Camp resources to all registered trainees (ProfessionalEducation.blood.ca); and **survey capabilities** to facilitate trainee registration, obtain participants feedback, and collect pre- and post-test results (SurveyMonkey).

Faculty members and administrative leads from participating universities and hospitals provide support for delivering the program to their trainees. These tasks include identifying trainees to participate in the program, organizing virtual seminars with appropriate technology for the sites that opted out of the centrally organized seminar breakout rooms, coordinating catering and/or catering gift cards as needed, organizing and leading team-based learning seminars, facilitating completion of TM knowledge assessments and registration/attendance records.

Analysis of the TM knowledge assessment completed by the trainees is performed by the University of Toronto.

## Registration and Attendance

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In 2021-2022, 377 trainees from 15 Canadian universities, including 12 different specialties, registered for Transfusion Camp and attended a minimum of one Day.

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Registration: 377 trainees from 12 different specialties and 15 Canadian universities registered for Transfusion Camp (Table 1). Trainees who initially registered for Transfusion Camp but did not attend a single Day were not included in the final registration count.

**Table 1: 2021-2022 Transfusion Camp registration.**

Academic Institution	Medical Programs	Trainees Registered	Mode of Participation
Dalhousie University	Hematopathology, Hematology, Pediatric Hematology/Oncology	9	Lectures: Live webinar Seminars: Virtual
McGill University	Critical Care Medicine, Hematology	12	Lectures: Live webinar Seminars: Virtual
McMaster University	Anesthesia, Critical Care Medicine, Internal Medicine, Pathology, Transfusion Medicine	28	Lectures: Live webinar Seminars: Virtual
Northern Ontario School of Medicine	Anesthesia	5	Lectures: Live webinar Seminars: Virtual
Queen's University	Anesthesia, Critical Care Medicine, Emergency Medicine, Hematology, Internal Medicine	18	Lectures: Live webinar Seminars: Virtual
Université de Montréal	Anesthesia, Critical Care Medicine, Hematology, Internal Medicine, Medical Oncology, Obstetrics, Pediatric Hematology/Oncology	55	Lectures: Live webinar Seminars: Virtual
Université de Sherbrooke	Anesthesia, Internal Medicine	21	Lectures: Live webinar Seminars: Virtual
Université Laval	Anesthesia, Hematology, Internal Medicine, Obstetrics	74	Lectures: Live webinar Seminars: Virtual
University of Alberta	Anesthesia, Hematology, Pathology	20	Lectures: Recorded videos individual viewing Seminars: Virtual
University of British Columbia	Anesthesia, Critical Care Medicine, Hematology, Pediatric Hematology/Oncology	33	Lectures: Recorded videos group viewing Seminars: Virtual
University of Manitoba	Hematology	4	Lectures: Live webinar Seminars: Virtual
University of Ottawa	Hematology	4	Lectures: Live webinar Seminars: Virtual
University of Saskatchewan	Anesthesia, Emergency Medicine	10	Lectures: Live webinar Seminars: Virtual
University of Toronto	Anesthesia, Critical Care Medicine, Hematology, Internal Medicine, Medical Oncology, Obstetrics, Pediatric Hematology/Oncology, Transfusion Medicine	62	Lectures: Live webinar Seminars: Virtual
Western University	Anesthesia	22	Lectures: Live webinar Seminars: Virtual

Modes of participation: All trainees viewed the lectures individually either during the live event (via Zoom Meeting) or by watching the recorded lectures provided on ProfessionalEducation.blood.ca. All trainees attended virtual seminars consisting of groups of 4-18 participants.

Attendance: Overall, maximum attendance was recorded on Day 1 (86%) and minimum attendance was recorded on Day 5 (58%). An average of 73% of registered trainees attended each Day (Table 2).

**Table 2:** Transfusion Camp attendance.

Attendance by Day, n (%)	
Day 1	325 (86)
Day 2	289 (77)
Day 3	285 (76)
Day 4	257 (68)
Day 5	219 (58)

Attendance percentages based on 377 registered trainees from Canadian sites.

## Knowledge Gain Assessment

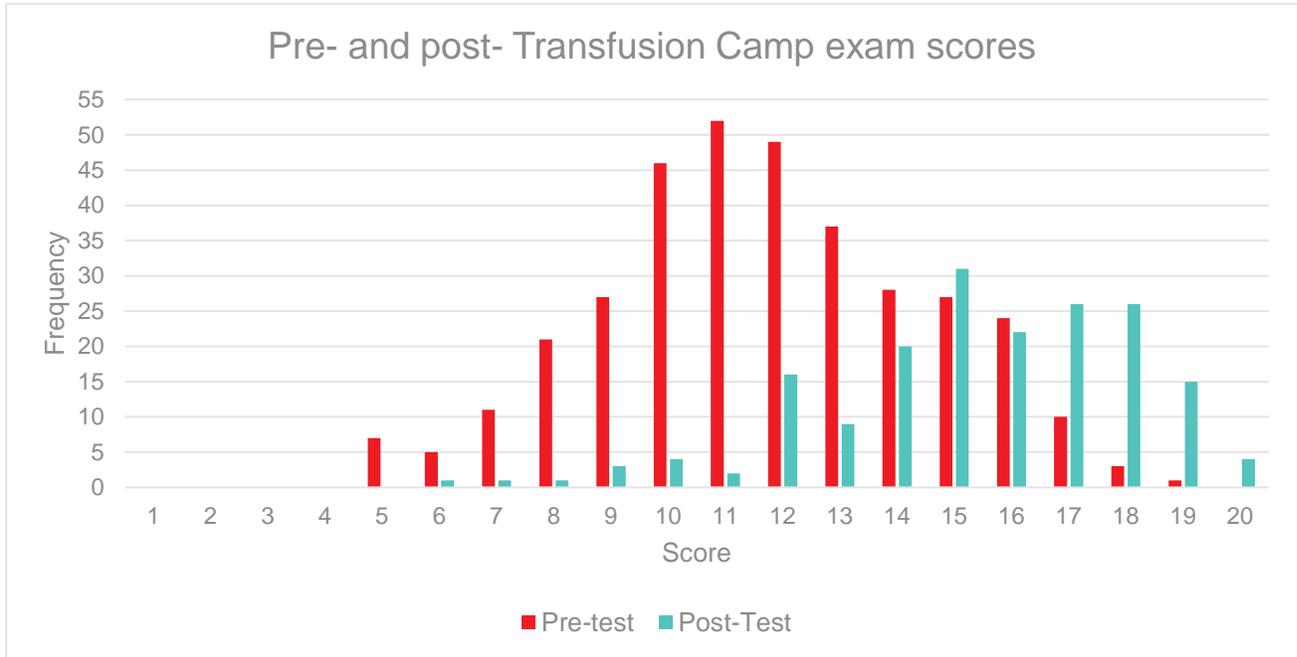
In 2021-2022, an increase in trainees' TM knowledge was observed. The attendees' mean knowledge assessment scores increased from 59% to 77% while the attendees' self-rating of TM knowledge increased from mostly beginner/intermediate to intermediate/advanced. Throughout the course, the majority of trainees (at least 65%) responding to a survey also indicated having applied the knowledge gained through Transfusion Camp in their clinical practice.

A knowledge assessment including 20 questions was distributed to all 377 registered trainees before Day 1 and after Day 5 via SurveyMonkey. 348 and 181 trainees completed the test pre-Day 1 and after Day 5, respectively. An overall increase in scores was observed following Transfusion Camp (59% vs 77% for pre- and post-test, respectively) (Figure 1). Attendees were also asked to self-rate their knowledge of TM before and after attending Transfusion Camp. Overall, attendees increased their self-rating from Beginner (57%)/Intermediate (39%) to Intermediate (70%)/Advanced (22%) (Figure 2).

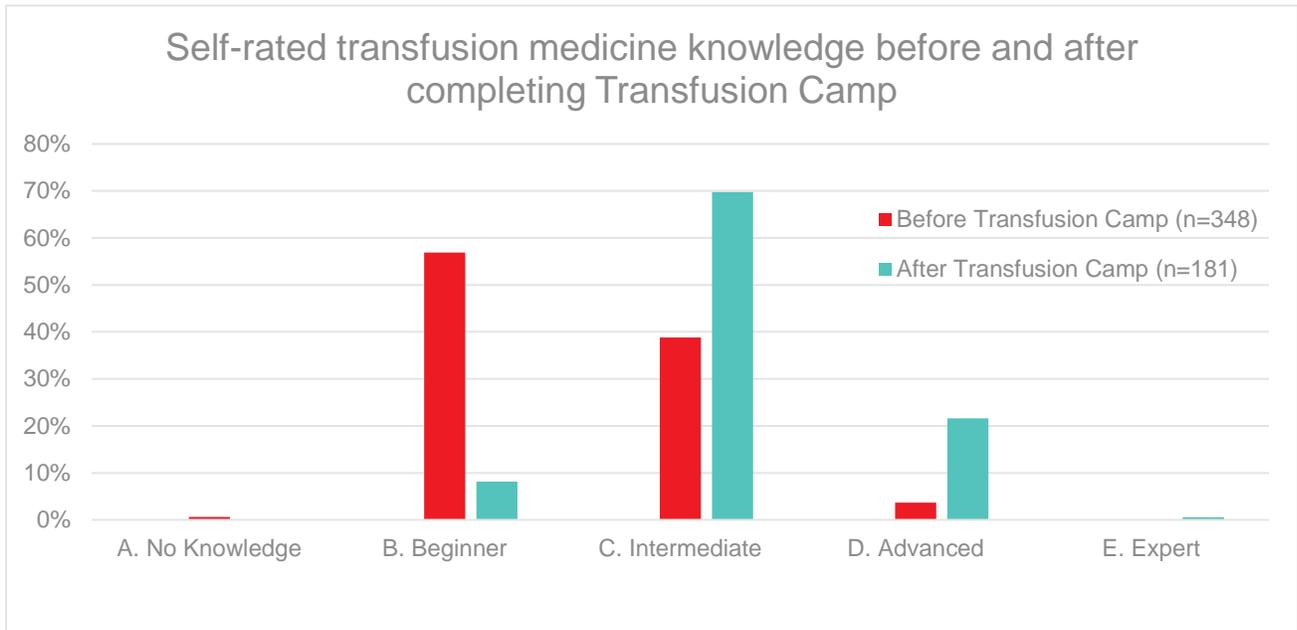
In addition to the pre-and post-tests, registered trainees were emailed a link to an electronic survey following each of the five Days. Beginning on Day 2, and after each subsequent day, trainees were asked "Since starting Transfusion Camp, have you applied any of your learning from Transfusion Camp into your clinical practice?". From Day 2 onwards, the majority of trainees responding to the surveys reported applying their learning from Transfusion Camp into their clinical practice (Figure 3).

**Figure 1: Pre-Test Scores vs. Post-Test Scores.**

<b>Pre-Test Scores</b>					
Total Possible Points	20	Median Score	12	Minimum Score	5
Total respondents	348	Mean Score (%)	11.7 (59)	Maximum Score	20
<b>Post-Test Scores</b>					
Total Possible Points	20	Median Score	16	Minimum Score	6
Total respondents	181	Mean Score (%)	15.4 (77)	Maximum Score	20



**Figure 2:** Self-rated knowledge of transfusion medicine by trainees.



**Table 3:** Application of knowledge imparted by Transfusion Camp in clinical practice.

Day (# of survey responses)	Day 2 (n = 61)	Day 3 (n = 88)	Day 4 (n = 51)	Day 5 (n = 88)
Trainees responding “Yes” to the survey question “Since starting Transfusion Camp, have you applied any of your learning from Transfusion Camp into your clinical practice?”	77.0% (n = 47)	64.8% (n = 57)	76.5% (n = 39)	68.2% (n = 60)

Responses provided by trainees who participated in the post-event survey after attending the Day.

## Program Curriculum Assessment

In 2021-22, Transfusion Camp lectures and team-based learning seminars were scored very highly by trainees.

Following each of the five days, registered trainees were invited to complete an electronic survey to assess the program delivery model and curriculum.

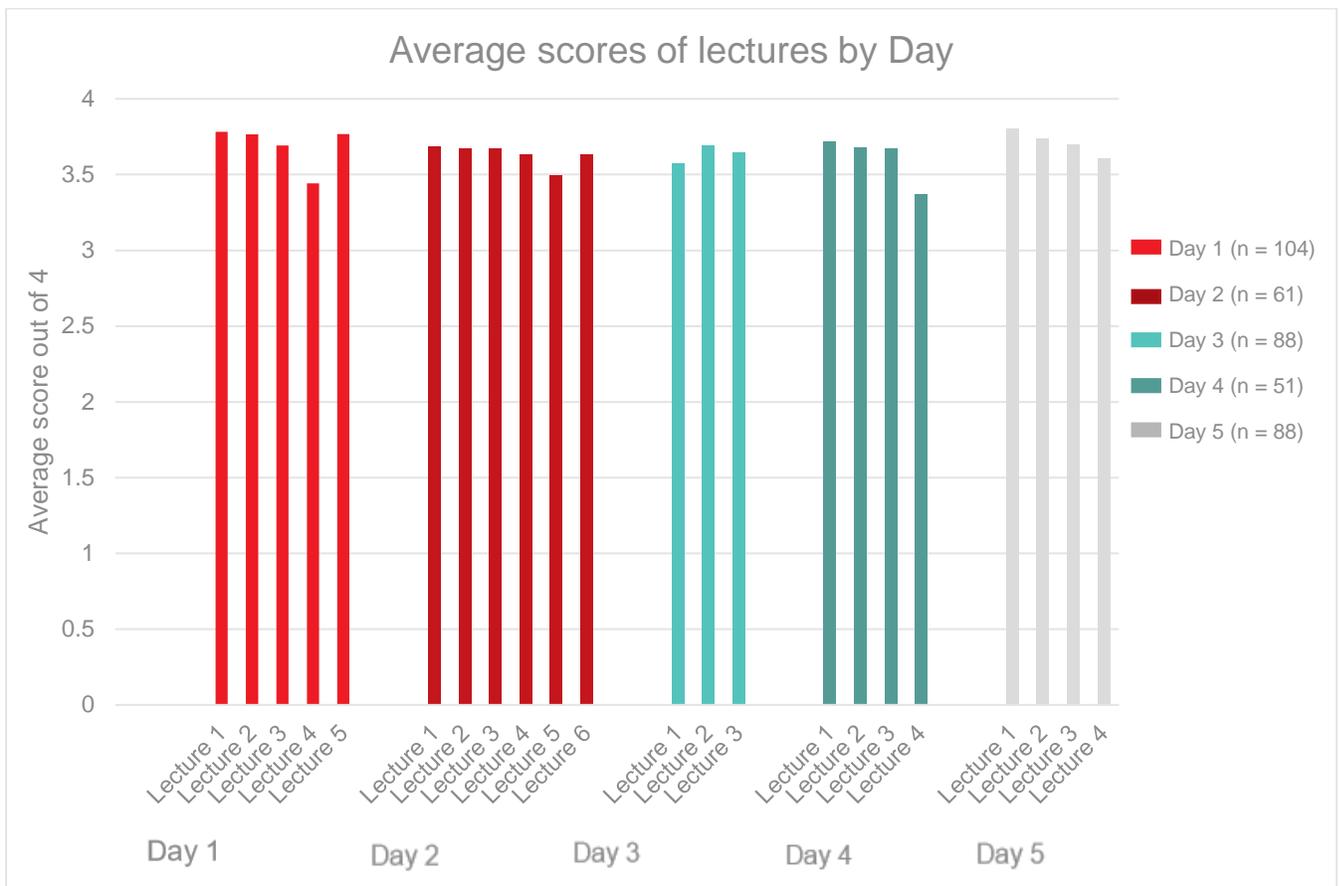
Trainees were asked to score (Poor = 1, Fair = 2, Good = 3, Excellent = 4) **lectures** on the following criteria: Objectives of presentation defined and met; Presentation skills; Balanced and unbiased; and Content had practical value. Average scores of each lecture were tallied to calculate the average lecture score. **All Transfusion Camp lectures were scored at 3.2/4 or higher** (Figure 3).

**The Day 5 Q&A: Ask the Experts Panel received an average rating of 3.6/4.**

Trainees were asked to indicate their level of agreement (Strongly Disagree = 1, Disagree = 2, Neutral = 3, Agree = 4, Strongly Agree = 5) with two aspects of each **seminar**: Content was relevant and organized; and Content had practical value. Average scores of each seminar were tallied to calculate the average seminar score for each day. **All Transfusion Camp seminars were scored at 4.1/5 or higher** (Figure 4).

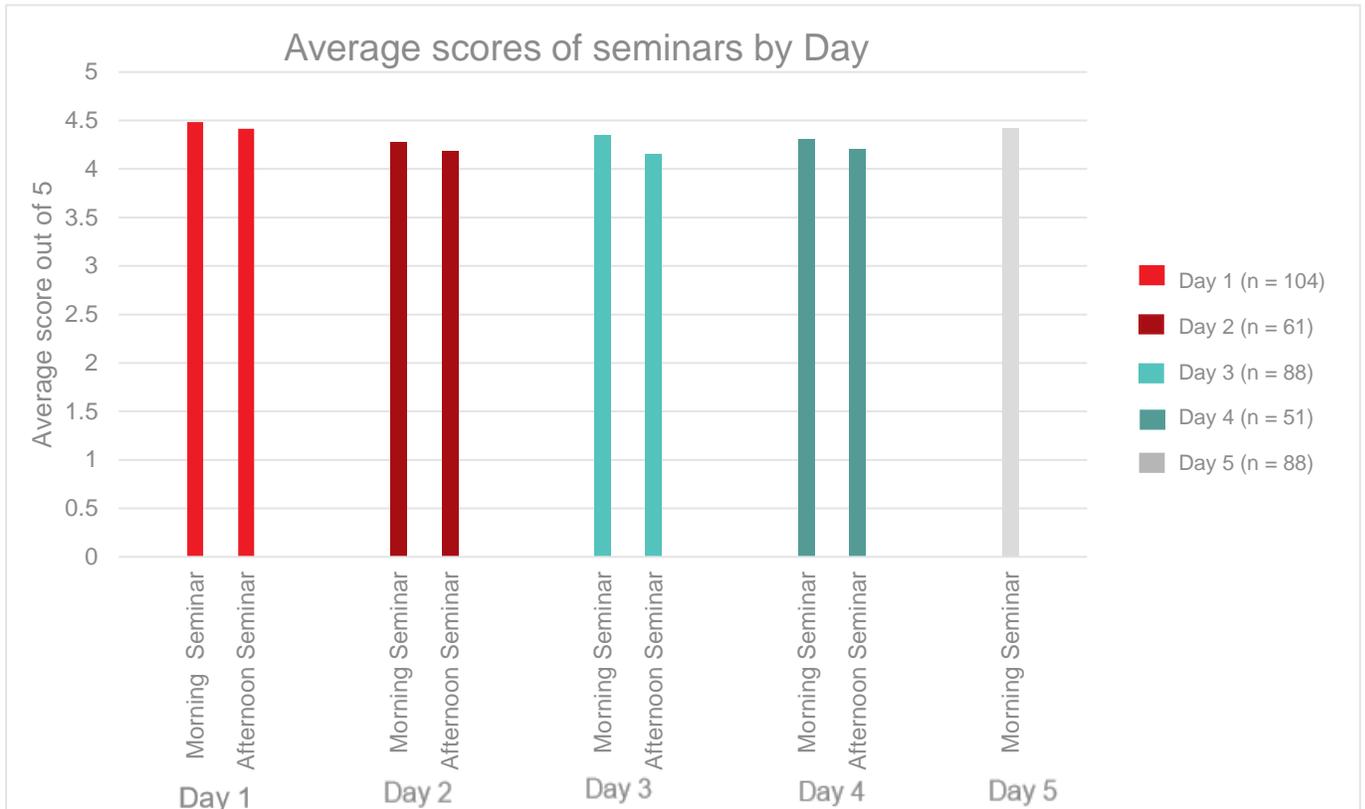
Lectures and seminars scores and comments were provided to the Planning Committee members and faculty to inform the curriculum for the following year.

**Figure 3.** Assessment of Transfusion Camp lectures by trainees.



Average scores calculated with assessments provided by trainees who participated in the post-event survey after attending the Day. Excludes the Day 5 “Q&A” session.

**Figure 4.** Assessment of Transfusion Camp seminars by trainees



Average scores calculated with assessments provided by trainees who participated in the post-event survey after attending the Day.

## International Partnerships

### UNITED KINGDOM

Since 2016-2017, the University of Oxford has participated in Transfusion Camp. Guy's Hospital & St. Thomas's Hospital and University Hospitals Birmingham NHS Foundation Trust joined Transfusion Camp in 2021-22. For all U.K. sites, trainees watch the pre-recorded lectures during their off time in the week leading up to their seminars. The morning and afternoon seminars are held with local TM experts on separate dates to facilitate trainee attendance.

### Registration and Attendance

In 2021-2022, 27 trainees registered for Transfusion Camp from 3 U.K. sites, representing 3 programs. Attendance was highest on Day 4 (89%) and the average attendance over the year was (77%).

**Table 4:** 2021-2022 Transfusion Camp registration at U.K. sites.

Institution	Medical Programs	Trainees Registered
Guy's Hospital & St. Thomas's Hospital	Hematology, Internal Medicine	6
University Hospitals Birmingham NHS Foundation Trust	Anesthesia, Hematology	6
University of Oxford	Anesthesia, Internal Medicine	15

**Table 5:** Transfusion Camp attendance at U.K. sites.

Attendance by Day, n (%)	
Day 1	21 (78)
Day 2	22 (81)
Day 3	16 (59)
Day 4	24 (89)
Day 5	21 (78)

Attendance percentages based on 27 registered trainees from U.K. sites.

### Knowledge Gain Assessment

The TM knowledge gain assessment methodology used for Canadian sites was applied to U.K. trainees. This included the pre- and post-tests. The results are shown in the table below and are not very different from the data obtained from the Canadian cohort. However, U.K. trainees were only asked to complete the feedback surveys following Day 3. As Transfusion Camp continues to expand to additional programs at participating sites in the U.K., trainees will be sent the feedback survey for all Days starting in 2022-2023.

**Table 6:** Pre-Test Scores vs. Post-Test Scores for U.K. trainees.

Pre-Test Scores					
Total Possible Points	20	Median Score	11	Minimum Score	5
Total respondents	22	Mean Score (%)	11 (55)	Maximum Score	16
Post-Test Scores					
Total Possible Points	20	Median Score	15.8	Minimum Score	6
Total respondents	10	Mean Score (%)	15.3 (77)	Maximum Score	18

### AUSTRALIA

In 2019-2020, Transfusion Camp established a collaboration with faculties at the Australian Red Cross Lifeblood (ARCL). This collaboration provides access to Transfusion Camp lectures and other resources for adaptation and delivery within the Australian transfusion medicine training environment. During 2021-2022, ARCL ran its third Transfusion Camp with the majority of attendees completing Hematology training. Trainees were able to download the lectures and watch them individually (see number of downloads below). However, no interactive sessions were held.

The adapted program included three modules:

Module 1: Transfusion basics: Basic blood bank testing (96 downloads), Red cell transfusion (39), Platelets transfusion (50), Plasma, PCC and cryo (55).

Module 2: Transfusion in practice: Pre-op PBM (local content) (27), Intra-op PBM (17).

Module 3: Critical bleeding: Massive Haemorrhage (16), Viscoelastic Testing (local content) (33).

## RWANDA PILOT

In June 2022, Toronto area Transfusion experts partnered with local faculty in Rwanda to deliver a modified Day 1 of the Transfusion Camp Program to postgraduate residents as a pilot program for delivering Transfusion Camp in lower resource settings. The Day 1 lectures and seminars were modified with input from local TM experts to focus on blood products available in Rwanda. The 28 trainees were provided access to a password protected page on ProfessionalEducation.blood.ca that housed the pre-recorded modified lectures and pre-readings for Transfusion Camp Rwanda. As part of the pilot program, Canadian Blood Services provided funding for internet access packages for participating trainees and faculty. WhatsApp was used for all communications to trainees regarding the one-day Camp.

The TM knowledge gain assessment pre- and post-test used for Canadian sites was applied to Rwandan trainees. The tests were not modified and thus contained questions on educational content not included in the one-day pilot program. The feedback from faculty and trainees was overwhelmingly positive.

**Table 7:** Pre-Test Scores vs. Post-Test Scores for Rwanda trainees.

<b>Pre-Test Scores</b>					
Total Possible Points	20	Median Score	8	Minimum Score	4
Total respondents	28	Mean Score (%)	7.5 (38)	Maximum Score	11
<b>Post-Test Scores</b>					
Total Possible Points	20	Median Score	10	Minimum Score	6
Total respondents	23	Mean Score (%)	10.3 (52)	Maximum Score	15

An abstract on the pilot program was submitted and accepted to the 2022 All Africa Anesthesia Conference (AAAC) by Dr. Justin Hagumimana, the lead resident in Rwanda.

## Reporting & Dissemination

- The **Transfusion Camp Annual Report** is distributed to all Program Directors participating in Transfusion Camp and to partners. It is also posted to the Transfusion Camp Course Portal on ProfessionalEducation.blood.ca.

- A needs assessment led by Dr. Lani Lieberman to understand pediatric transfusion medicine education for non-TM specialized pediatric physicians initiated during the 2021-2022 year. The project is on-going and an oral presentation entitled “Pediatric transfusion medicine education for non-TM physicians: A Needs assessment” was presented by Dr. Lani Lieberman at the **CSTM 2022 Annual Meeting**.
- A quantitative research project was led by Dr. Mahboubeh Rahmani to evaluate the current time dedicated to transfusion education in Canadian undergraduate medical school training and postgraduate performance on the 2021-22 Transfusion Camp pre-test. The project was completed in 2021-2022 and an oral abstract entitled “Evaluating the current state of Canadian undergraduate medical school training in transfusion medicine” was presented by Dr. Mahboubeh Rahmani at the **CSTM 2022 Annual Meeting** and an abstract has been accepted at the **AABB 2022 Annual Meeting**.
- A project to investigate the impact of Transfusion Camp on self-reported physician behavior was completed in 2021-2022 and included data over three academic years (2018-2021) of Transfusion Camp trainees. An oral abstract entitled “The Self-reported Impact of Transfusion Camp on Postgraduate Trainee Transfusion Behaviour: A Retrospective Study” was presented by Katie Yeung at the **CSTM 2022 Annual Meeting**. A manuscript for publication in a peer-reviewed journal is in preparation.
- An abstract was accepted to the **2022 AAAC** entitled “Transfusion Camp in Rwanda: a feasibility pilot study to assess course delivery and sustainability”.
- **Transfusion Camp for Nurse Practitioners:** In 2019-2020, Transfusion Camp established a collaboration with a group in British Columbia. This collaboration provides access to Transfusion Camp lectures and other resources for adaptation and delivery to nurse practitioners in British Columbia. 2021-2022 saw the fourth and fifth iterations of this targeted Camp.

## Contributing Partners

We remain deeply grateful for the ongoing support from our funders, partners and colleagues across the transfusion medicine community in Canada and abroad. We thank the trainees and faculty members who participated in Transfusion Camp and the following local Transfusion Camp site administrative leads and collaborators: Dr. Yulia Lin, Paula Nixon, Sue Belaga, (University of Toronto); Dr. Alan Timmouth, Tyra Young, Alexandra Moniz (University of Ottawa); Dr. Patricia Pelletier, Dr. Gordan Samoukovic, Sandy Fostaty, Anna Ballarano (McGill University); Dr. Michelle Zeller, Gina Furlong, Erin Volk, Erin Alderson (McMaster University); Sara Cover (Northern Ontario School of Medicine); Dr. Janet Lui, Michelle Sviajina (Queen’s University); Dr. Mahboubeh Rahmani, Julie Griffith (Dalhousie University); Dr. Sheila Harding, Dr. Oksana Prokopchuk-Gauk, Debbie Quirion, Megan Fortosky, Georgie Blackwell (University of Saskatchewan); Dr. Ziad Solh, Dr. Cyrus Hsia, Sheila Schembri (Western University); Dr. Patrice Beauregard, Dr. Catherine Latour, Dr. Susan Fox, Dr. Pierre-Aurèle Morin, Valérie Bédard, Marie-Josée Bernier (Université de Sherbrooke); Dr. Marianne Lavoie (Université

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We acknowledge the following planning committee members for their contributions to the program including curriculum development and delivery, logistics, and administration. Dr. Waseem Anani, Sue Balaga, Dr. Jeannie Callum, Dr. Sophie Chargé, Dr. Christine Cserti-Gazdewich, Dr. Pablo Perez D'Empaire, Casey Kapitany, Dr. Aditi Khandelwal, Dr. Wendy Lau, Dr. Christie Lee, Dr. Lani Lieberman, Dr. Yulia Lin (Chair), Paula Nixon, Wendy Owens, Dr. Katerina Pavenski, Dr. Jacob Pendergrast, Dr. Nadine Shehata, Dr. Michael Scott, and Tory Thompson.

We also take this opportunity to express gratitude to our funding contributors including: Canadian Blood Services, Ontario Regional Blood Coordinating Network, University of Toronto (Department of Laboratory Medicine & Pathobiology), Western University (Department of Hematology), McGill University (Critical Care Medicine Program), the University of Saskatchewan, Dalhousie University (Departments of Hematology and Hematopathology), and the University of British Columbia's Centre for Blood Research.

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# Appendix I: 2021-2022 Transfusion Camp program and schedule



## University of Toronto Transfusion Camp 2021-2022

### Participating universities

**Alberta:** University of Alberta

**British Columbia:** University of British Columbia

**Nova Scotia:** Dalhousie University

**Ontario:** University of Toronto, University of Ottawa, McMaster University, Queen's University, Northern Ontario School of Medicine, Western University

**Québec:** McGill University, Université Laval, Université de Montréal, Université de Sherbrooke

**Saskatchewan:** University of Saskatchewan

**International:** Guys Hospital & St. Thomas Hospital (U.K.), University Hospitals Birmingham NHS Foundation Trust (U.K.), University of Oxford (U.K.)



## UNIVERSITY OF TORONTO TRANSFUSION CAMP 2021-2022 CURRICULUM

# LEARNING OBJECTIVES

Upon completion of this course, the attendees will be able to:

### **INDICATIONS FOR BLOOD COMPONENTS**

1. Appropriately prescribe components (RBC, plasma, platelets, and fibrinogen replacement)
2. Perform a preoperative bleeding history
3. Interpret coagulation testing results
4. Have a reasonable approach to the correction of coagulation prior to procedures

### **BLOOD BANK TESTING**

5. Summarize basics about blood bank tests and pre-transfusion compatibility testing
6. Explain the implications of a positive antibody screen
7. Know when to screen patients for platelet alloimmunization

### **RISKS OF TRANSFUSION**

8. Obtain informed consent for transfusion
9. Prevent, diagnose, manage and report acute and delayed transfusion reactions
10. State the current risks of transfusion-transmitted infections
11. Describe challenges to transfusion safety (getting the right blood to the right patient)

### **INDICATIONS FOR BLOOD PRODUCTS**

12. Appropriately prescribe plasma protein products (albumin, coagulation factor concentrates)
13. State when and how Rh immunoglobulin is administered in pregnancy

### **SPECIAL TRANSFUSION SITUATIONS**

14. Know when to order irradiated blood components
15. Develop an approach to patients with congenital or acquired bleeding disorders (including reversal of common anticoagulants)
16. Safely transfuse a patient with sickle cell disease
17. Manage a massively hemorrhaging patient, including surgical, trauma and obstetric patients, with discussion of hemostatic medications (antifibrinolytics)

### **BLOOD CONSERVATION**

18. Have a standard approach to the management of pre-operative anemia
19. Apply patient blood management strategies, including for patients who refuse blood on religious grounds



## TARGET AUDIENCE

Trainees from participating universities and registered in non-hematology specialty adult or pediatric programs including pediatric or adult programs in Anesthesia, Critical Care Medicine, Oncology, Obstetrics, Pathology, Clinical Pathology, General Internal Medicine, General Surgery, Trauma, and Emergency Medicine. Hematology and Hematopathology residents are also welcome to attend.

Depending on location, there may be a maximum number of local attendees allowed.

## ATTENDEE EXPECTATIONS

### **PARTICIPATION**

1. Attend all sessions.
2. Actively participate during lectures.
3. Actively participate in team-based learning seminars.
4. Refrain from excessive use of interruption devices (mobile phones).
5. Arrange not to be on call the night before.
6. Complete evaluations.

### **COST**

Free for Canadian University trainees at the PGY1 level or greater.

### **REGISTRATION**

1. Register by contacting your program director.
2. Trainees must have their program director's approval to participate.
3. In addition to access to the course and course portal, registration may also provide appropriate refreshments at breaks, depending on location and circumstances.



## COURSE INFORMATION

### FORMAT

- Content is delivered over 5 days (see schedule below) from September to June.
- Each day includes lectures and team-based learning seminars.
- Trainees attend lectures in groups either “live” (in Toronto) or “live” remotely (via webcast) or “post-live” (recorded lectures) depending on local preferences and circumstances.
- Trainees attend team-based learning seminars in groups in person at their local sites or virtually, depending on local preferences and circumstances.

### LOCATIONS

Locations for trainees to attend the course will depend on the format chosen by their university program. The university program administrator will communicate to their trainees the chosen format (live, live remotely or post-live) and the locations and dates for the events. The trainee Transfusion Camp Course portal (hosted at <https://profedu.blood.ca>) also provides the Course dates and locations for all participating university programs.

### MATERIAL & CERTIFICATION

Trainees will be provided with:

1. Access to a Course portal for resources: including course program and schedule; pre-reading publications; lectures’ slide presentations, recordings and highlights; seminars’ case studies and guide.
2. Depending on the university program, a Certificate of Completion of Transfusion Medicine Camp with attendance, and pre-test and post-test scores. To obtain a certificate, trainees must attend 3 of 5 days and complete the post-test exam.



## COURSE PROGRAM & SCHEDULE FOR “LIVE” ATTENDANCE 2021-2022 CURRICULUM

COURSE SCHEDULE

### DAY 1> BLOOD COMPONENTS & PRODUCTS INDICATIONS & ADMINISTRATION – September 17, 2021

#### Start time (EST)

	On Your Own	Pre-Course Exam provided via email and administered via online survey tool (30 minutes)
9:00	Dr. Jeannie Callum	Red Cell Transfusion (45 minutes)
9:45	Dr. Katerina Pavenski	Platelet Transfusion (45 minutes)
10:30		<b>Break</b> (15 minutes)
10:45	Dr. Yulia Lin	Basic Blood Bank Testing (30 minutes)
11:15	Facilitated Seminar 1A	RBC & Platelet Transfusion Cases, developed by Dr. Katerina Pavenski (75 minutes)
12:30		<b>Lunch</b> (45 minutes)
13:15	Dr. Lani Lieberman	Neonatal & Pediatric Transfusion (30 minutes)
13:45	Dr. Aditi Khandelwal	Plasma, PCC & Fibrinogen replacement (60 minutes)
14:45		<b>Break</b> (15 minutes)
15:00	Facilitated Seminar 1B	Plasma, PCC & Fibrinogen Cases, developed by Dr. Aditi Khandelwal (75 minutes)

### DAY 2> COMPLICATIONS: COMPATIBILITY, ACUTE & LONG TERM TRANSFUSION RISKS & ERRORS – November 19, 2021

#### Start time (EST)

9:00	Dr. Katerina Pavenski	Informed Consent (30 minutes)
9:30	Dr. Steven Drews	Acute & Delayed Transfusion Transmitted Infections (30 minutes)
10:00		<b>Break</b> (15 minutes)
10:15	Dr. Cserti-Gazdewich	Acute Non-Infectious Reactions (45 minutes)
11:00	Facilitated Seminar 2A	Labile Component Reactions, developed by Dr. Christine Cserti-Gazdewich (90 minutes)
12:30		<b>Lunch (non-Québec sites)</b> (60 minutes)
	Dr. Nancy Robitaille	Virtual Héma-Québec tour ( <b>Québec sites</b> ) (30 minutes)
13:00		<b>Lunch (Québec sites)</b> (60 minutes)
13:30	Dr. Michelle Zeller	Virtual Canadian Blood Services tour ( <b>non-Québec sites</b> ) (30 min)
14:00	Dr. Waseem Anani	Delayed Non-Infectious Reactions (30 minutes)
14:30		<b>Break</b> (15 minutes)
14:45	Facilitated Seminar 2B	"Delayed or Derivative" Transfusion Reactions, developed by Dr. Akash Gupta (90 minutes)



COURSE SCHEDULE...

**DAY 3> SPECIAL TRANSFUSION SITUATIONS – MATERNAL, PERIOPERATIVE BLEEDING ASSESSMENT, SICKLE CELL DISEASE – January 21, 2022**

**Start time (EST)**

9:00	Dr. Nadine Shehata	Alloimmunization & Anemia in Pregnancy (45 minutes)
9:45	Dr. Zachary Liederman	Bleeding Assessment & Approach to INR/PTT (45 minutes)
10:30		<b>Break</b> (15 minutes)
10:45	Facilitated Seminar 3A	Perioperative Bleeding Assessment, developed by Dr. Zachary Liederman (90 minutes)
12:00		<b>Lunch</b> (45 minutes)
13:00	Dr. Jacob Pendergrast	Sickle Cell Disease (60 minutes)
14:00		<b>Break</b> (15 minutes)
14:15	Facilitated Seminar 3B	SCD & Transfusion, developed by Dr. Jacob Pendergrast (105 minutes)

**DAY 4> PATIENT BLOOD MANAGEMENT, CONSERVATION AND COMPLEX HEMOSTASIS – March 25, 2022**

**Start time (EST)**

9:00	Dr. Yulia Lin	Pre-operative Patient Blood Management (45 minutes)
9:45	Dr. Keyvan Karkouti	Intra-op Patient Blood Management: Tranexamic Acid; Salvage and Triggers (45 minutes)
10:30		<b>Break</b> (15 minutes)
10:45	Facilitated Seminar 4A	Patient Blood Management, developed by Dr. Yulia Lin (90 minutes)
12:15		<b>Lunch</b> (45 minutes)
13:00	Dr. Natasha Rupani	Congenital Coag – VWD, Hemophilia (35 minutes)
13:35	Dr. Carolyne Elbaz	Reversal of antiplatelets & direct anticoagulants (40 minutes)
14:15		<b>Break</b> (15 minutes)
14:30	Facilitated Seminar 4B	Advanced Hemostasis Testing & Management, developed by Dr. Eric Tseng (90 minutes)

**DAY 5> TRAUMA, MASSIVE TRANSFUSION PROTOCOLS & CONTROVERSIAL ENTITIES – May 13, 2022**

**Start time (EST)**

9:00	Dr. Jeannie Callum	Massive Hemorrhage: Pathophysiology & Evidence based management (60 minutes)
10:00	Dr. Katerina Pavenski	Massive Hemorrhage Protocols: Real World Application (45 minutes)
10:45		<b>Break</b> (15 minutes)
11:00	Facilitated Seminar 5A	Massive, Disaster Bleeding Cases, developed by Dr. Jeannie Callum (90 minutes)
12:30		<b>Lunch</b> (30 minutes)
13:00	Dr. Justyna Bartoszko	Albumin (45 minutes)
13:45	Dr. Aditi Khandelwal	New updates in Transfusion (35 minutes)
14:20		<b>Break</b> (15 minutes)
14:30	Panel	Ask the Experts: Q&A (45 minutes)
	On your Own	Post-Course Exam - online (30 minutes)



**Canadian  
Blood  
Services**

BLOOD  
PLASMA  
STEM CELLS  
ORGANS  
& TISSUES



Laboratory Medicine & Pathobiology  
**UNIVERSITY OF TORONTO**

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