

Transfusion Camp Annual Report

2018-2019



In memory of Dr. Elianna Saidenberg, an exceptional mentor and teacher who made invaluable contributions to Transfusion Camp and transfusion medicine practice.

2020-02-14

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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 postgraduate medical residents and their faculty members in various specialties related to transfusion in Canada.

First established in 2012 as a centrally-delivered TM education program for postgraduate trainees at the University of Toronto, Transfusion Camp 2018-2019 engaged medical training programs representing 12 different specialties from 10 Canadian universities and one U.K. university, and has trained >750 trainees since the 2016-2017 academic year. It is delivered through the collaboration of transfusion experts with residency training program administrators and managed centrally by Canadian Blood Services' Centre for Innovation. Transfusion Camp counts multiple partners who facilitate the delivery of this unique program locally.

In a study published in 2019, we demonstrated that Transfusion Camp increased knowledge, fostered positive attitude towards TM and enabled a self-reported positive impact on transfusion practice in postgraduate trainees.¹ Transfusion Camp has been recognized as a novel and scalable approach to delivering effective TM education.

This first annual report of Transfusion Camp provides highlights of the program's achievements from July 2018 to June 2019. Program highlights for the year include:

- 215 trainees, representing 12 medical specialties from 10 Canadian universities and one U.K. university participated in Transfusion Camp.
- 15 hours of didactic lectures were delivered by 17 transfusion experts from Toronto and supplemented by 13 hours of team-based learning seminars delivered by 25 faculty members from across Canada.
- Assessments of TM knowledge using a validated test, conducted before and after program completion showed an overall increase in mean scores (Pre-Camp 54% vs. Post-Camp 70%).
- The majority of trainees responding to the feedback surveys self-reported that they have applied their learning from Transfusion Camp to their clinical practice (from a minimum of 55% after Day 1 to a maximum of 87% after Day 5).
- Dr. Yulia Lin, Chair of the Transfusion Camp Planning Committee received the 2019 AABB President's Award for her contributions to the education of junior doctors through the Transfusion Camp program.
- Medical programs from McGill University and the Northern Ontario School of Medicine joined Transfusion Camp during the year.

Program Overview

Program objective

Blood transfusion is the most common procedure administered in hospitalized patients and is prescribed by physicians of almost every specialty.^{2,3} 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.⁴ 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.⁵⁻⁷ However, several studies have shown that TM knowledge at this level is deficient.⁸⁻¹³ 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 to effective educational methodologies. Established at the University of Toronto in 2012, Transfusion Camp has now expanded nationally and also includes partners in the U.K.

Program content and delivery

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

The main learning objectives for 2018-19 were: **Indications for blood products, Blood bank testing, Risks of transfusion, Indications for manufactured blood products, Special transfusion situations, Blood conservation.** The program content was delivered over five days on July 20, September 21, January 11, March 22, and May 17. Participants were provided with 39 publications as part of pre-reading materials, received a total of 15 hours of didactic lectures and actively participated in 13 hours of team-based learning seminars.

Didactic lectures were delivered in person by 17 faculty in Toronto and broadcast live to eight sites across Canada. Team-based learning seminars, developed by faculty in Toronto, consisting of relevant case studies were led by 25 local transfusion medicine experts with supporting materials provided by the program. Video recordings of the lectures were made available to all participants, including participating schools in distant time zones (i.e. University of British Columbia and Oxford University (U.K.)). At these distant schools, trainees viewed the recorded lectures as either a group or individually, followed by team-based learning seminars led by local transfusion medicine experts. See Appendix I for full details on the program, faculties, planning committee members, partners and collaborators.

Program evaluation

Trainees completed a TM knowledge assessment at the start of Day 1 and at the end of Day 5. In addition, a post-event 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' Centre for Innovation provides support for delivering the program on a national scale. These tasks include managing Camp registration and attendance; collecting and analyzing trainee feedback; and recruitment and onboarding of prospective participating universities. The technology resources required to deliver the Camp include a **collaborative online sharing platform** (Microsoft SharePoint) where all program related materials for trainees, faculties and local program administrators are housed and can be accessed throughout the year; **webinar technology** (GoToWebinar) to broadcast and record the lectures; **video editing capabilities** (Adobe Premiere Elements); **survey capabilities** to facilitate trainee registration and obtain participants feedback (SurveyMonkey).

Faculty members and administrative leads from participating universities provide support for delivering the program to their trainees. These tasks include identifying trainees to participate in the program, booking meeting rooms with appropriate technology, coordinating catering as needed, 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

In 2018-2019, 215 trainees from 11 universities, including 12 different specialties, registered for Transfusion Camp. Maximum and minimum attendance were recorded on Day 1 (169) and Day 5 (126), respectively.

Registration: 215 trainees from 12 different specialties and 10 Canadian universities registered for Transfusion Camp, including 14 trainees from the University of Oxford (U.K.) (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: 2018-19 Transfusion Camp registration.

Academic Institution	Medical Programs	Trainees Registered	Mode of Participation
Dalhousie University	Hematopathology, Hematology	8	Lectures: Live webinar Seminars: In-person
McGill University	Critical Care Medicine, Emergency Medicine	11	Lectures: Live webinar Seminars: In-person
McMaster University	Anesthesia, Critical Care Medicine, Emergency Medicine, Hematology, Internal Medicine, Obstetrics, Pathology, Pediatric Hematology/Oncology, Surgery	28	Lectures: Live webinar Seminars: In-person
Northern Ontario School of Medicine	Anesthesia	11	Lectures: Live webinar (group and individual) Seminars: In-person and via webinar
Queen's University	Anesthesia, Hematology	13	Lectures: Live webinar Seminars: In-person
University of British Columbia	Anesthesia, Critical Care Medicine, Emergency Medicine, Hematology, Hematopathology, Internal Medicine, Obstetrics, Pediatric Hematology/Oncology	26	Lectures: Recorded videos group viewing Seminars: In-person
University of Ottawa	Hematology	7	Lectures: Live webinar Seminars: In-person
University of Saskatchewan	Emergency Medicine, Hematopathology, Pathology	14	Lectures: Live webinar Seminars: In-person
University of Toronto	Anesthesia, Critical Care Medicine, Hematology, Internal Medicine, Medical Oncology, Obstetrics, Pediatric Hematology/Oncology,	68	Lectures: Live in-person Seminars: In-person
Western University	Anesthesia, Hematology	15	Lectures: Live webinar Seminars: In-person
University of Oxford (U.K.)	Anesthesia, Critical Care Medicine, Hematology	14	Lectures: Recorded videos individual viewing Seminars: In-person

Modes of participation: Most Canadian trainees attended the lectures in-person as a group (University of Toronto) or remotely as a group via webinar. All trainees from the University of British Columbia and University of Oxford viewed the recorded lectures as a group or individually, respectively (Table 1). All trainees attended the seminars in-person in groups of 7-15 participants. A few trainees from the Northern Ontario School of Medicine attended the lectures and seminars individually via webinar.

Attendance: Overall, maximum attendance was recorded on Day 1 (77%) and minimum attendance was recorded on Day 5 (59%). An average of 67% of registered trainees attended each Day (Table 2).

Table 2: Transfusion Camp attendance.

Attendance by Day, n (%)	
Day 1	169 (77)
Day 2	157 (73)
Day 3	140 (65)
Day 4	134 (62)
Day 5	126 (59)

Attendance percentages based on 215 registered trainees.

Knowledge Gain Assessment

In 2018-2019, an increase in trainees' TM knowledge was observed. The attendees' mean knowledge assessment scores increased from 54% to 70% while the attendees self-rating of TM knowledge increased from mostly beginner/intermediate to intermediate/advanced. The majority of trainees responding to a survey also indicated having applied the knowledge gained through Transfusion Camp in their clinical practice.

A validated knowledge assessment including 20 questions was completed in writing by Transfusion Camp attendees at the start of Day 1 (pre-test; n=169) and at the end of Day 5 (post-test; n=125). An overall increase in scores was observed following Transfusion Camp (54% vs 70% for pre- and post-test, respectively) (Figure 1). In addition, attendees were asked to self-rate their knowledge of TM before (n=169) and after (n=125) attending Transfusion Camp. Overall, attendees increased their self-rating from Beginner (51%)/Intermediate (42%) to Intermediate (68%)/Advanced (18%) (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?". The majority of trainees responding to the surveys reported applying their learning from Transfusion Camp into their clinical practice (Figure 3).

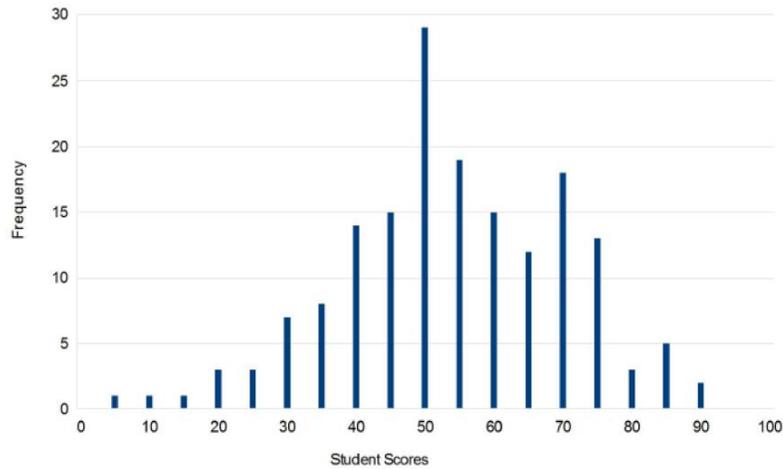
Figure 1: Pre-Test Scores vs. Post-Test Scores.

Pre-Test

Total Possible Points:	20	Median Score:	11	Maximum Score:	18
Total Students:	169	Mean Score:	10.82	Minimum Score:	1
Standard Deviation:	3.26	Reliability Coefficient (KR20):	0.66	Range of Scores:	17

Overall

Mean Score: 54.11%



Post-Test

Total Possible Points:	20	Median Score:	14	Maximum Score:	19
Total Students:	125	Mean Score:	13.99	Minimum Score:	7
Standard Deviation:	2.78	Reliability Coefficient (KR20):	0.62	Range of Scores:	12

Overall

Mean Score: 69.96%

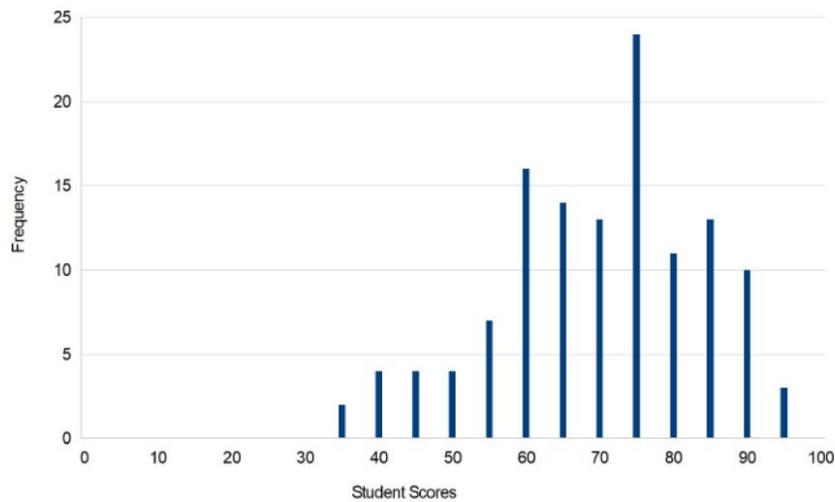


Figure 2: Self-rated knowledge of transfusion medicine by trainees.

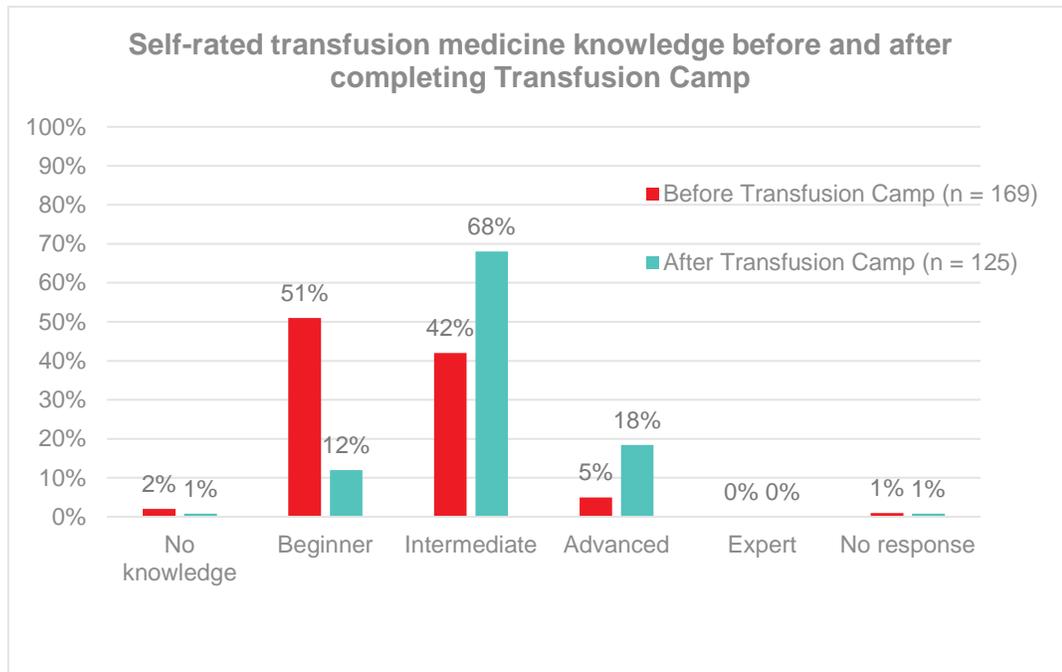


Table 3: Application of knowledge imparted by Transfusion Camp in clinical practice.

Day (# of survey responses)	Day 2 (n = 29)	Day 3 (n = 30)	Day 4 (n = 33)	Day 5 (n = 24)
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?”	55.2% (n = 16)	56.7% (n = 17)	69.7% (n = 23)	87.5% (n = 21)

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

Program Assessment

In 2018-19, Transfusion Camp lectures and team-based learning seminars were scored very highly by trainees.

Following each of the five days, registered trainees were emailed a link to an anonymous electronic survey to assess the program delivery model and content.

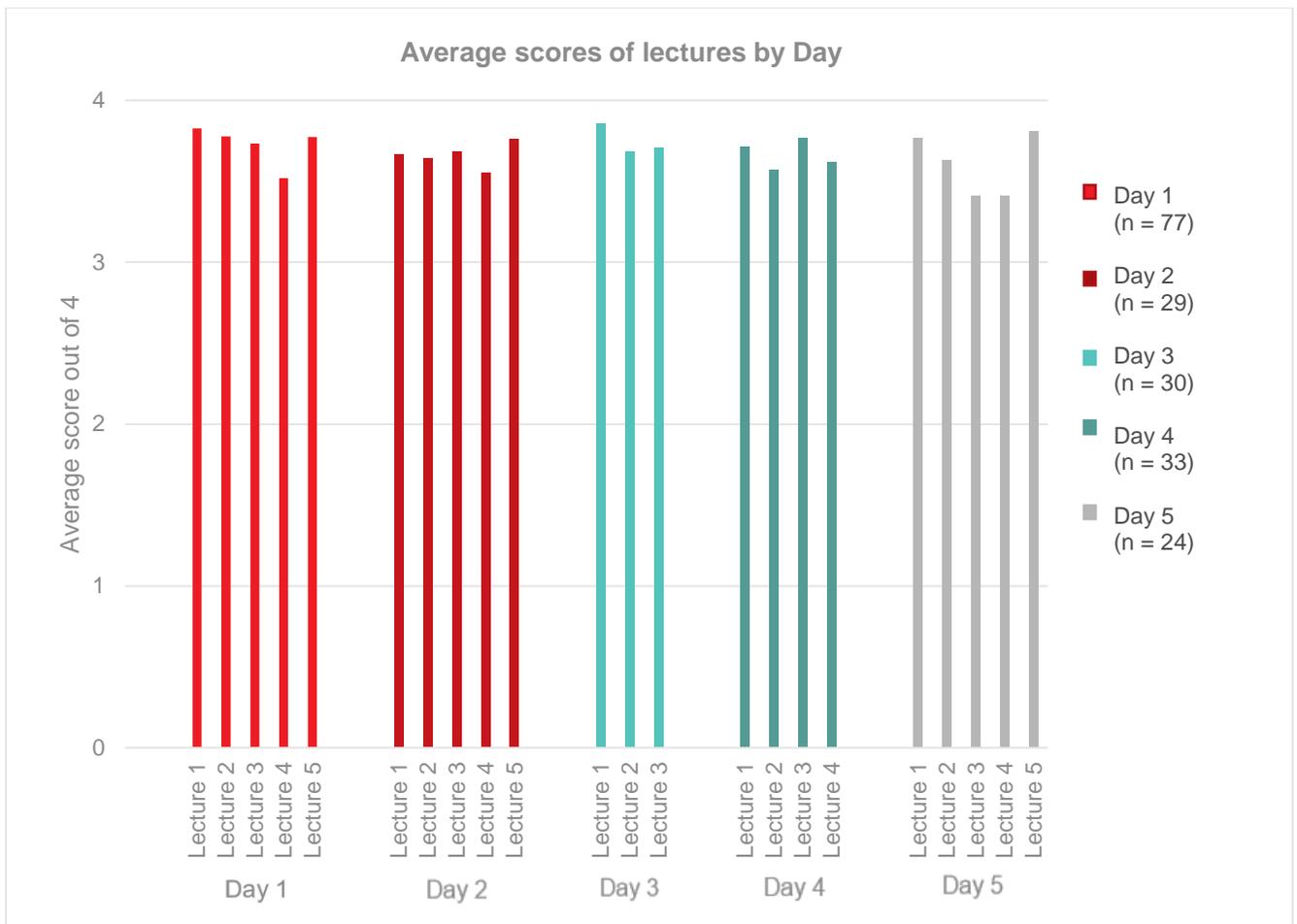
Trainees were asked to score (Poor = 1, Fair = 2, Good = 3, Excellent = 4) lectures on the following criteria: Objectives of presentation defined and met; Practical value; Knowledge of

topic; Presentation skills; and Balanced and unbiased. Average scores of each lecture were tallied to calculate the average lecture score. All Transfusion Camp lectures were scored at 3.4/4 or higher (Figure 3).

Trainees were asked to indicate their level of agreement (Strongly Disagree = 1, Disagree = 2, Neutral = 3, Agree = 4, Strongly Agree = 5) with several aspects of each seminar including: Content was relevant and organized; Content had practical value; Interaction with others was beneficial; and This seminar should be kept every year. 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).

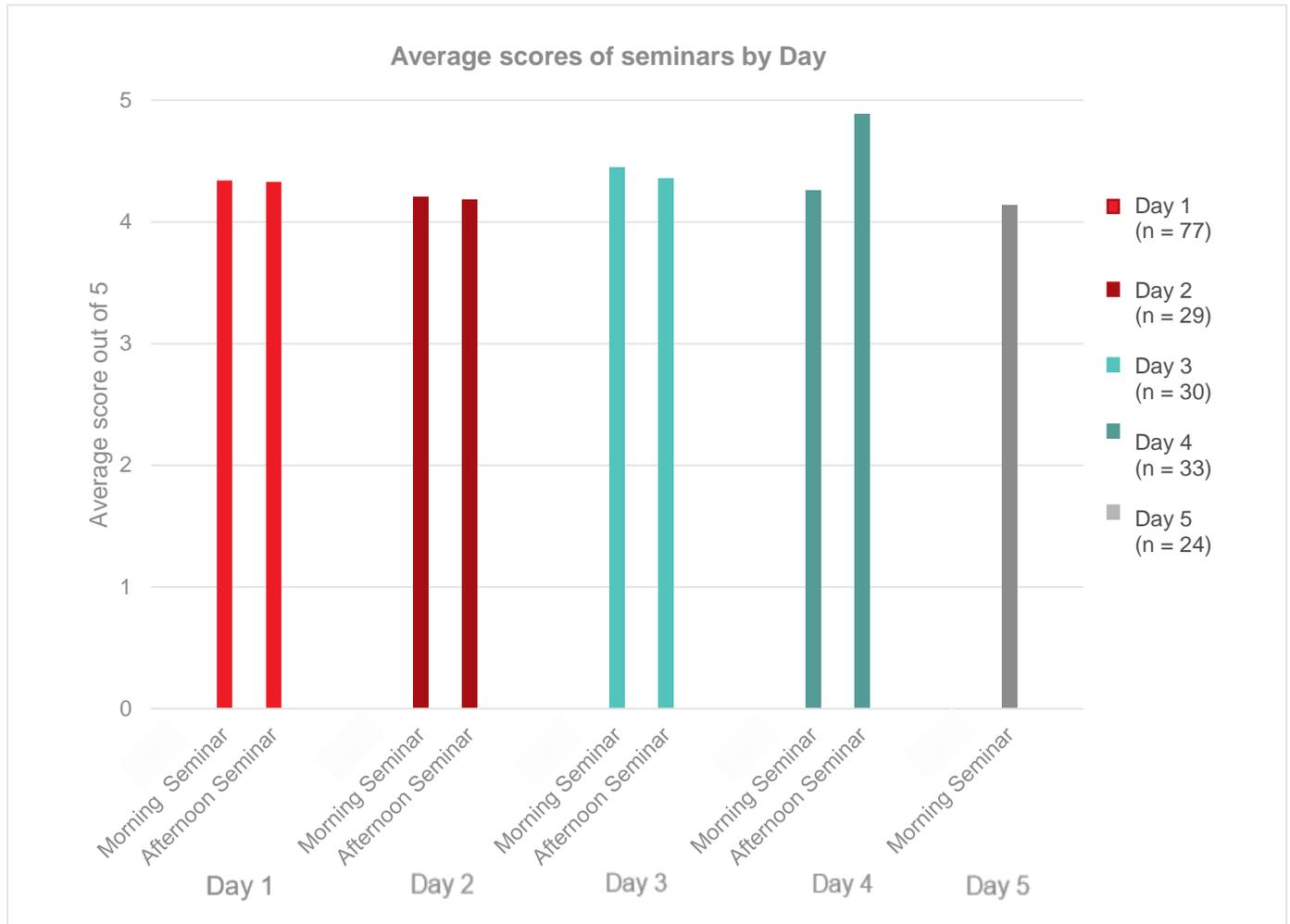
Lectures and seminars scores and comments were provided to the Planning Committee members and faculties to update content for next year.

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.

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.

Transfusion Camp Dissemination

- The impact of Transfusion Camp on transfusion medicine knowledge and self-reported behaviour was published in *Transfusion*.¹
- The Transfusion Camp Annual Report will be distributed to all Program Directors participating in Transfusion Camp and to partners.

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 Balaga, Miriam Strzinar (University of Toronto); Dr. Elianna Saidenberg, Dr. Alan Tinmouth, Vincent Paul, Alycia-Anne Martin, Tyra Young (University of Ottawa); Dr. Dev Jayaraman, Teresa Lavecchia (McGill University); Dr. Michelle Zeller, Jess Clarke, Elena Bidochka, Gina Furlong (McMaster University); Dr. Robert Anderson, Sara Cover (Northern Ontario School of Medicine); Dr. Jill Dubebout, Shelly Cox (Queen's University); Dr. David Conrad, Heidi Devlin (Dalhousie University); Dr. Sheila Harding, Dr. Oksana Prokopchuk-Gauk, Debbie Quirion, Leah Chomyshen (University of Saskatchewan); Dr. Ziad Solh, Mattina Kranenburg (Western University); Dr. Jacqueline Trudeau, Dr. Ed Conway, Hana Kim, Stefanie Mak (University of British Columbia); Dr. Michael Murphy, Dr. Stephen Hibbs, June Smith (University of Oxford).

We acknowledge the following planning committee members for their contributions to the program including curriculum development and delivery, logistics, and administration. Dr. Asim Alam, Sue Balaga, Dr. Jeannie Callum, Dr. Sophie Chargé, Dr. Christine Cserti-Gazdewich, Casey Kapitany, Dr. Keyvan Karkouti, Dr. Wendy Lau, Dr. Christie Lee, Dr. Lani Lieberman, Dr. Zachary Liederman, Dr. Yulia Lin, Dr. Stuart McCluskey, Dr. Paula Nixon, Dr. Katerina Pavenski, Dr. Jacob Pendergrast, Dr. Elianna Saidenberg, Dr. Rita Selby, Dr. Nadine Shehata, Dr. Michelle Sholzberg, Dr. Jordan Tarshis, Everad Tilokee.

We also take this opportunity to express gratitude to our funding contributors including: Canadian Blood Services' Centre for Innovation, Ontario Regional Blood Coordinating Network, 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.

References

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Appendix I: 2018-2019 Transfusion Camp program



University of Toronto Transfusion Camp 2018-2019

Participating universities

University of Toronto, University of Ottawa, McGill University, McMaster University, Northern Ontario School of Medicine, Queen's University, Dalhousie University, University of Saskatchewan, Western University, University of British Columbia, Oxford University



UNIVERSITY OF TORONTO TRANSFUSION CAMP 2018-2019 CURRICULUM

LEARNING OBJECTIVES

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

INDICATIONS FOR BLOOD PRODUCTS

1. Appropriately prescribe components (RBC, plasma, platelets, and cryoprecipitate)
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 MANUFACTURED BLOOD PRODUCTS

12. Appropriately prescribe fractionated blood 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 products
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 (Blackberries, iPhones)
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 also provides appropriate refreshments at breaks, depending on location



COURSE INFORMATION

COURSE INFO

FORMAT

- Content is delivered over 5 days (see schedule below) usually from July to May
- Each day includes lectures and team-based learning seminars
- Trainees attend lectures in group either “live” (in Toronto) or “live” remotely (via webcast) or “post-live” (recorded lectures)
- Trainees attend team-based learning seminars in groups at their local sites

LOCATIONS

- The course lectures are presented, webcast and recorded from St. Michael’s Hospital LiKaShing Institute, Allan Waters Auditorium, Toronto
- Locations for trainees to attend the course vary depending on university program, please enquire with your program administrator

MATERIAL & CERTIFICATION

Attendees will be provided with:

1. Access to a common course portal for reading materials, PDFs and recorded presentations, case studies and a discussion board
2. Exam review session
3. Depending on the university program, a Certificate of Completion of Transfusion Medicine Camp with attendance, and pre-test and post-test scores. To obtain certification, trainees must attend 3 of 5 days and complete the post-test exam.



COURSE SCHEDULE FOR SITES ATTENDING “LIVE” 2018-2019 CURRICULUM

COURSE SCHEDULE

DAY 1> BLOOD COMPONENT INDICATIONS & ADMINISTRATION – July 20, 2018

Start time

8:30	Dr. Yulia Lin	Pre-Course Exam (30 minutes)
9:00	Dr. Jeannie Callum	Red Cell Transfusion (45 minutes)
9:45	Dr. Yulia Lin	Basic Blood Bank Testing (30 minutes)
10:15		Break (15 minutes)
10:30	Dr. Lani Lieberman	Platelet Transfusion (45 minutes)
11:15	Dr. Katerina Pavenski	Seminar 1A: RBC & Platelet Transfusion Cases (75 minutes)
12:30		Lunch (60 minutes)
13:30	Dr. Lani Lieberman	Neonatal & Pediatric Transfusion (30 minutes)
14:00	Dr. Jeannie Callum	Plasma, PCC & Cryoprecipitate (60 minutes)
15:00		Break (15 minutes)
15:15	Dr. Jeannie Callum	Seminar 1B: Plasma, PCC & Cryoprecipitate Cases (75 minutes)

DAY 2> COMPLICATIONS: COMPATIBILITY, ACUTE & LONG TERM TRANSFUSION RISKS & ERRORS – September 21, 2018

Start time

9:00	Dr. Katerina Pavenski	Informed Consent (30 minutes)
9:30	Dr. Margaret Fearon	Acute & Delayed Transfusion Transmitted Infections (30 minutes)
10:00		Break (15 minutes)
10:15	Dr. Christine Cserti-Gazdewich	Acute Non-Infectious Reactions (45 minutes)
11:00	Dr. Christine Cserti-Gazdewich	Seminar 2A: Labile Component Reactions (90 minutes)
12:30		Lunch (60 minutes)
13:30	Dr. Robert Skeate	Virtual Canadian Blood Services Tour (30 minutes)
14:00	Dr. Robert Skeate	Delayed Non-Infectious Reactions (30 minutes)
14:30		Break (15 minutes)
14:45	Dr. Jacob Pendergrast	Seminar 2B: “Delayed or Derivative” Transfusion Reactions (90 minutes)



COURSE SCHEDULE...

DAY 3> SPECIAL TRANSFUSION SITUATIONS – MATERNAL, PERIOPERATIVE BLEEDING ASSESSMENT, SICKLE CELL DISEASE – January 11, 2019

Start time

9:00	Dr. Nadine Shehata	Anemia & Transfusion in Women of Child-bearing Age (30 minutes)
9:30	Dr. Zachary Liederman	Bleeding Assessment & Approach to INR/PTT (45 minutes)
10:15		Break (15 minutes)
10:30	Dr. Elianna Saidenberg	Seminar 3A: Perioperative Bleeding Assessment (90 minutes)
12:00		Lunch (60 minutes)
13:00	Dr. Jacob Pendergrast	Sickle Cell Disease (60 minutes)
14:00		Break (15 minutes)
14:15	Dr. Jacob Pendergrast	Seminar 3B: SCD & Transfusion (105 minutes)

DAY 4> PATIENT BLOOD MANAGEMENT, CONSERVATION AND COMPLEX HEMOSTASIS - March 22, 2019

Start time

9:00	Dr. Yulia Lin	Pre-operative Patient Blood Management (30 minutes)
9:45	Dr. Keyvan Karkouti	Intra-op Patient Blood Management: Tranexamic Acid; Salvage and Triggers (45 minutes)
10:30		Break (15 minutes)
10:45	Dr. Yulia Lin	Seminar 4A: Patient Blood Management (90 minutes)
12:15		Lunch (45 minutes)
13:00	Dr. Michelle Sholzberg	Congenital Coag – VWD, Hemophilia (30 minutes)
13:30	Dr. Rita Selby	Reversal of antiplatelets & direct anticoagulants (45 minutes)
14:15		Break (15 minutes)
14:30	Dr. Nadine Shehata	Seminar 4B: Advanced Hemostasis Testing & Management (90 minutes)

DAY 5> TRAUMA, MASSIVE TRANSFUSION PROTOCOLS & CONTROVERSIAL ENTITIES – May 17, 2019

Start time

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		Break (15 minutes)
11:00	Dr. Jeannie Callum	Seminar 5A: Massive, Disaster Bleeding Cases (90 minutes)
12:30		Lunch (45 minutes)
13:15	Dr. Stuart McCluskey	Albumin (30 minutes)
13:45	Dr. Jordan Tarshis	Transfusion Authority Gradient (45 minutes)
14:30		Break (15 minutes)
14:45	Dr. Yulia Lin	Review Session
15:45	Dr. Yulia Lin	Post-Course Exam (30 minutes)



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Laboratory Medicine & Pathobiology
UNIVERSITY OF TORONTO



St. Michael's
 Inspired Care.
 Inspiring Science.

