



**UNIVERSITY OF ALBERTA**  
**FACULTY OF MEDICINE & DENTISTRY**  
Department of Laboratory Medicine & Pathology



**ALBERTA PRECISION  
LABORATORIES**

Leaders in Laboratory Medicine

## **CLINICAL FELLOWSHIP PROGRAM IN TRANSFUSION MEDICINE**

Department of Laboratory Medicine and Pathology  
Faculty of Medicine and Dentistry, University of Alberta  
and  
Alberta Precision Laboratories

# CLINICAL FELLOWSHIP IN TRANSFUSION MEDICINE

## INTRODUCTION and BACKGROUND

The Fellowship Program in Transfusion Medicine at the University of Alberta is tailored to the needs of the individual fellow. The Alberta Public Laboratories – Edmonton Zone Transfusion Medicine service is the largest zonal transfusion service served by Canadian Blood Services. There is a broad scope of reference immunohematology and clinical transfusion medicine support for a wide variety of clinical specialties including pediatric and adult hematology /oncology, solid organ transplant, critical care, obstetrics/ gynecology, trauma, and cardiovascular surgery. For the typical fellow involved in the program, there will be rotations through the reference blood bank, rapid response laboratories and Canadian Blood Services. There may be additional opportunity for involvement with specialty clinics in both adult and pediatric hemostasis management. During the one year, program the fellow will be exposed to work up of a wide variety of transfusion medicine activities.

The faculty within the division of Transfusion Medicine, our laboratory scientists and technical staff will provide expertise in all aspects of transfusion medicine. Fellows are supervised, in rotation, by all participating staff and faculty members in order to get the benefit of the subspecialty expertise that is available in the region, and be exposed to different points of view. They will participate in clinical consulting activities and teaching activities in which the transfusion services provides. Fellows will also participate in the teaching programs of the University during which they may supervise residents, undergraduate medical students and medical laboratory science students. Clinical research is also a requirement and time allotment is provided.

## PROGRAM CURRICULUM

The Transfusion Medicine Fellowship program curriculum will include a wide variety of exposures to transfusion medicine practice. The fellow will be primarily located at University of Alberta Hospital site with rotations in the other transfusion medicine laboratories across Alberta Public Laboratories and Alberta Health Services. There will be a mandatory rotation through the Canadian Blood Services – Edmonton Centre with elective opportunities for rotations at Canadian Blood Services - Calgary and NIRL sites as funding from other sources allow.

### Rotations:

Rotations are arranged in a flexible way to avoid duplication of areas in which the fellow may have had significant previous experience and to strengthen weak areas. The rotation schedule may also be adjusted depending on the fellows' progress. A minimum of one month is devoted to research.

### Seminars, Rounds and Teaching Sessions

Numerous rounds and teaching sessions will be available to participating fellows. Locally these will include weekly Joint Hematology rounds, blood bank sign out rounds, and weekly Hematopathology / Hematology academic half days. In addition, the transfusion medicine fellow will participate in the monthly Transfusion Medicine Seminar Series coordinated by Canadian Blood Services.

### Clinical/On Call Experience

After suitable exposure to the operations of the clinical program, the fellow will be expected to be on a transfusion medicine call roster with graduated responsibility.

### Quality Management

The fellow will be broadly exposed to the Quality system operations, accreditation requirements and audits within the transfusion medicine laboratory. A major focus will be developing an understanding and approach to

dealing with the implementation of safe transfusion practices in the clinical environment sufficient to fulfill accreditation standards. The fellow will be expected to participate in transfusion medicine oversight committees such as the Edmonton zone Transfusion Medicine Committee and Edmonton zone transfusion medicine test optimization committee.

Research and Development

The fellow will be expected to be involved with any R&D activities occurring in the transfusion medicine laboratory during their training period. A minimum of a one month rotation to focus on a specific research or validation project is mandatory.

**PROGRAM OBJECTIVES**

At the completion of fellowship training in the Clinical Transfusion Medicine environment, the fellow will have acquired the following competencies and will function effectively in the following CanMEDS roles:

| Role                                     | Key Competencies   |
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| Medical expert / clinical decision maker | <ol style="list-style-type: none"> <li>1. Have expert knowledge of the indications for blood component therapy, alternatives to blood products, and complications associated with transfusion</li> <li>2. Have expert knowledge of complex antibody investigations, and be able to appropriately direct testing and selection of product</li> <li>3. Have expert understanding of transfusion related adverse events and their investigation and follow up</li> <li>4. Have an awareness of the regulations and standards that govern the field of transfusion medicine in Canada and other jurisdictions</li> <li>5. Have an in depth understanding of the methods used in reference transfusion medicine laboratories, the scope of blood components and blood products available in Canada and standard clinical transfusion practice issues.</li> <li>6. Basic understanding of the structure/regulatory structure of the blood system in Canada.</li> <li>7. Be aware of the international nature of transfusion practice.</li> <li>8. Knowledge of Canadian Blood Services policies and operations regarding the following:               <ol style="list-style-type: none"> <li>a) blood donor recruitment and donor management.                   <ul style="list-style-type: none"> <li>• Discuss strategies for donor recruitment and</li> </ul> </li> </ol> </li> </ol> |

retention.

b) blood donor registration, screening and acceptance criteria; recognition and management of complications of blood donation.

- Walk-through donor registration and screening process
- Review Health Assessment Questionnaire (HAQ)
- Review Donor Screening Criteria Manual (DSCM)
- Observe 1 or more whole blood donations including arm preparation technique
- Discuss types of apheresis machines and principles of operation
- Observe plasmapheresis and/or plateletpheresis collection
- Discuss care of the donor including monitoring of frequency of donations and laboratory monitoring
- Discuss potential complications of whole blood and apheresis collections and the management of these events
- Visit a mobile blood donor clinic (if possible).

c) Knowledge of tests used to screen donated blood for infectious diseases and their interpretations; appropriate management/follow-up of donors with reactive transmissible disease test results.

d) Knowledge of blood group serological procedures (ABO and Rh typing, antibody screening and identification, antigen typing) of blood donations and donor follow-up including donors with positive direct antiglobulin test.

e) Knowledge of specialized testing performed on blood inventory and appropriate indications for products undergoing this testing (CMV testing, HPA testing, screening for anti-IgA).

f) Understand methods for preparation of blood components and fractionation products, the composition of these components/products and the necessary storage and transportation requirements for various products.

- Observe receipt of blood donations from a clinic into the laboratory
- Observe the processing of whole blood donations to components including buffy-coat production.
- Observe cryoprecipitate and frozen plasma production
- Observe packing of blood products for shipment to hospitals.

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|              | <p>g) Discuss process for blood product recall/blood product retrieval from hospital.</p> <p>h) Understand quality control measures in place to maintain standards for blood products and for apheresis donor monitoring.</p> <p>i) Expert knowledge of tests used in antenatal management of hemolytic disease of the fetus/newborn.</p> <ul style="list-style-type: none"> <li>▪ Review and discuss COPs relating to serologic testing during pregnancy including testing schedules, protocols for RhIG administration.</li> <li>▪ Observe at least one Galileo/Neo test run.</li> <li>▪ Discuss interpretation of titres and reporting of critical values</li> <li>▪ Discuss management of prenatal patients with antibodies, both alloantibodies and autoantibodies and the distinction between a clinically significant and a clinically insignificant antibody in the prenatal setting</li> <li>▪ Discuss the prenatal genotyping program and the appropriate indications for this procedure.</li> </ul> <p><b><u>*Donor Testing Laboratory (Calgary - CBS).</u></b></p> <p>j) Knowledge of tests/technologies used to screen donated blood for infectious diseases.</p> <p>k) Knowledge of blood grouping methodologies specific to testing of blood donations.</p> <ul style="list-style-type: none"> <li>▪ Observe test procedures pertaining to j) and k)</li> <li>▪ Observe quality management and data processing pertaining to j) and k)</li> <li>▪ Observe specimen receipt, accessioning and sample shipping requirements for donor samples</li> </ul> |
| Communicator | <p>1. Communicate effectively with medical colleagues, nursing staff, technologists and patients about all aspects of transfusion medicine including:</p> <ul style="list-style-type: none"> <li>• Appropriate product selection and dose</li> <li>• Appropriate consideration of alternatives to transfusion</li> <li>• Informed consent for transfusions</li> <li>• Appropriate blood bank testing for pre-transfusion purposes and investigation of transfusion events</li> </ul> <p>2. Be able to clearly direct and instruct technical staff in an</p>   |

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|              | <p>effective and efficient manner to ensure appropriate testing is completed and correct products are administered</p> <p>3. Be able to document in the patient record recommendations related to blood product support and alternatives.</p>   |
| Collaborator | <p>1. Effectively participate as part of a multidisciplinary team to provide optimal patient care by:</p> <ul style="list-style-type: none"> <li>• Actively advising and consulting with respect to optimal blood product support for individual patients</li> <li>• Actively advising and consulting with respect to optimal inventory distribution within a hospital and a region</li> </ul> <p>2. Act as a liaison between the laboratory, the clinical departments, and the blood collection agency.</p> <p>3. Understand the 'vein-to-vein' model for delivery of transfusion services and the importance of collaboration between the Blood Centre, hospitals, physicians and nurses involved in the transfusion process</p>  |
| Manager      | <p>The fellow shall be able to:</p> <p>a) Understand the elements of GMP (Good Manufacturing Practices) and the importance of these processes in ensuring the safety of the blood supply.</p> <ul style="list-style-type: none"> <li>• Walk-through the quality support structure including document control, non-conformance reporting, management of customer complaints, process control and other elements of ISO/GMP.</li> </ul> <p>b) Understand the importance of utilization monitoring and appropriate utilization of blood components, blood products and transfusion resources.</p> <ul style="list-style-type: none"> <li>• Approach the allocation of scarce resources and unlicensed products.</li> <li>• Aid in the development of an inventory management strategy.</li> <li>• Ensure that appropriate policies are in place for effective and safe issue and transfusion of blood products.</li> <li>• Describe the transfusion medicine organizational</li> </ul> |

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|                        | <p>structure and roles of the following:</p> <ol style="list-style-type: none"> <li>1. the blood supplier</li> <li>2. the transfusion medicine committee</li> <li>3. the operational structure within the laboratory itself</li> </ol> <ul style="list-style-type: none"> <li>▪ List the essential elements of and be able to develop processes for a quality system in the transfusion service</li> </ul>  |
| <p>Health advocate</p> | <ol style="list-style-type: none"> <li>1. Recognize alternatives to transfusion that may be appropriate and make pertinent recommendations to clinical colleagues and patients.</li> <li>2. Recognize the importance of informed consent for transfusion and patient notification of transfusion and advocate their consistent use with clinical colleagues.</li> <li>3. Understand the logistics, time requirements, donor impact and expense of collecting specialized products such as apheresis platelets and the importance of using these products appropriately. <ul style="list-style-type: none"> <li>• Discuss the process for selection of apheresis platelet donors for alloimmunized patients including infants with NFAIT (neonatal/fetal alloimmune thrombocytopenia)</li> <li>• Understand the process for HLA screening of blood donors</li> </ul> </li> <li>4. Understand the importance of reporting adverse reactions to transfusion and the implications for blood donors of various types of reactions (e.g. TRALI). Know the follow-up required by the blood supplier and role of the hospital transfusion services in facilitating this process. <ul style="list-style-type: none"> <li>▪ Discuss process for serious adverse transfusion event reporting</li> <li>▪ Discuss protocol for management of TRALI and IgA donor screening.</li> <li>▪ understand the blood supplier role in TRALI case review</li> </ul> </li> <li>5. Understand the importance of traceability of blood components and blood products and how Canadian Blood Services and hospital transfusion services ensure that this is done.</li> </ol> |

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|              | <p>6. Be aware of the importance of and logistics involved in lookback and traceback activities at both the Blood Centre and the hospitals with an understanding of the essential role of supporting these activities.</p>  |
| Scholar      | <p>1. Serve as an educational resource for other health care professionals with respect to transfusion medicine.</p> <p>2. Facilitate the learning of residents, students and allied health professionals by participation in rounds, seminars, inservices, courses and academic half days.</p> <p>3. Ask relevant questions with respect to practices, policies and investigations</p> <p>4. Participate in and or evaluate research related to test optimization and validation as well as clinical trials related to appropriate blood product use.</p> <p>5. Be aware of the importance of new technologies, research and development for creating and maintaining a centre of excellence for transfusion medicine.</p> <ul style="list-style-type: none"> <li>• By attending stem cell collections at CCI or TBCC will understand the process and be able to effectively troubleshoot stem cell collections</li> </ul> |
| Professional | <p>1. Approach all product requests in an ethical and consistent manner.</p> <p>2. Exhibit exemplary professional behavior during interactions with patients, medical colleagues and allied health professionals.</p> <p>3. Follow up occurrences/adverse events with a consistent, non-accusatory, information-gathering process.</p>  |

## **SPECIALTY TRAINING REQUIREMENTS**

Eligible candidates must have a completed residency training with a minimum of 4 years of hematological pathology or general pathology OR internal medicine residency and 1 year of clinical hematology OR pediatric residency plus 1 year of clinical hematology is required

## **DURATION AND LOCATION**



The duration of the fellowship is typically twelve months of approved training in adult and pediatric transfusion medicine but previous experience and exposure may allow for flexibility of program duration. The fellow will be primarily located at the University of Alberta Hospital site with rotations throughout the APL/ AHS-Edmonton Zone hospital facilities in addition to the Canadian Blood Services – Edmonton Centre. Opportunities for elective rotations through Canadian Blood Services - Calgary and Ottawa NIRL sites as well as a rotation through the Foothills Hospital Transfusion Medicine Service to allow exposure to transfusion support for stem cell / bone marrow transplant recipients may be available and will be evaluated on an individual basis and available external funding sources.

## **EVALUATION & SUPERVISION**

Although coordinated through the Transfusion Medicine Divisional Director, the faculty member assigned to the transfusion service for each rotation will be responsible for fellow supervision and rotation evaluation. As part of the fellowship, there will be case based practical examinations that will be coordinated on a 6 monthly basis. The performance of fellows is noted on the formal evaluation, which is done every six months. The fellows will also provide evaluations of each rotation.

## **RESOURCES AND PERSONNEL**

### **Space and Workload**

Space for the transfusion medicine fellow will be shared with the trainees involved in the residency training program.

### **Funding**

Funding for the successful fellowship training candidate will be provided by the Department of Laboratory Medicine and Pathology, University of Alberta commensurate to training level on the PARA scale.

### **Staff Responsible for Supervision and Instruction**

Coordination of the Transfusion Medicine Fellowship program will be through the Transfusion Medicine Section Chief's office. Transfusion Medicine clinical and technical staff will supervise the fellow in rotation in order to get the benefit of the subspecialty expertise that is available in the province and to allow the fellow to be exposed to different points of view.

The primary medical staff involved in the fellowship program will include, but are not limited to:

APL – North Sector: Susan Nahirniak MD, FRCPC; Hanan Gerges MD, FRCPC

APL-Calgary Zone: Davinder Sidhu MD, FRCPC; Meer-Taher Shabani-Rad MD, FRCPC

Canadian Blood Services: Gwen Clarke MD, FRCPC; Jason Acker MBA, PhD

## **ACCREDITATION AND CERTIFICATION**

Upon successful completion the fellow will be issued a certificate from the office of Post Graduate Medical Education, Faculty of Medicine, University of Alberta, affirming that subspecialty training in Transfusion Medicine has been successfully completed.

## **RECOMMENDED READING and EDUCATION RESOURCES**

A detailed reading package will be provided at the commencement of the fellowship program but generally recommended resources include:

- Websites:
  - CSTM - [www.transfusion.ca](http://www.transfusion.ca)
  - Canadian Blood Services (including Clinical Guide to Transfusion) - [www.transfusionmedicine.ca](http://www.transfusionmedicine.ca)

- Bloody Easy Manual -  
[http://transfusionontario.org/en/cmdownloads/categories/bloody\\_easy/](http://transfusionontario.org/en/cmdownloads/categories/bloody_easy/)
- Textbooks:
  - AABB Technical Manual, 17<sup>th</sup> edition
  - Petrides M. Practical Guide to Transfusion 2<sup>nd</sup> edition
  - Mintz PD. Transfusion Therapy: Clinical Principles and Practice 3<sup>rd</sup> edition
  - Reid ME. The Blood Group Antigens Facts Book, 2<sup>nd</sup> edition