

**CURRICULUM FOR
HEMATOLOGY-ONCOLOGY FELLOWSHIP PROGRAM**
(Hematology-Oncology Track and Hematology Track)
PUGET SOUND BLOOD CENTER
Transfusion Service

Location: Puget Sound Blood Center (PSBC) and University of Washington Medical Center (UWMC)

Duration: Hematology-Oncology track fellows: one month in first year; one month in second year. Hematology track fellows: one month in first year.

Staff: Each sub-rotation at PSBC is staffed by an attending Hematologist or Laboratory Medicine Physician responsible for that area of the laboratories or clinical services.

Faculty: Drs. Terry Gernsheimer, Thomas Price, Theresa Nester, Diana Gilligan, Neil Josephson, Sherrill Slichter, Arthur Thompson, Richard Counts, Michael Strong, Karen Nelson.

Call: The fellow takes call two consecutive days a week with night call from home on those days.

General Description:

The focus of this rotation is to understand theory and practical application of Transfusion and Immunohematology toward developing consultative and primary management skills in these subdisciplines of Hematology. The Puget Sound Blood Center is the central transfusion service for all of King County and outlying area hospitals. The laboratories at PSBC provide reference services for testing and provide blood collection and distribution services. The clinical service performs apheresis procedures and provides transfusion consultation to this area. The fellow rotates through all of the major laboratories and services of PSBC.

Laboratory Services:

Fellows will spend 2-day to 1-week rotations in several laboratories and blood bank services that serve as the reference laboratories and central services for the Puget Sound area. Rotations include donor collection and blood processing, crossmatch and antibody identification, HLA and platelet immunology, donor testing and coagulation. Many of these rotations involve consultation with a referring physician in the management of clinical immunologic and transfusion problems. An attending physician at PSBC discusses and follows all cases with the fellow for whom they are providing consultation.

Clinical Services:

Fellows take call two days a week by pager, reviewing orders for blood components from several Seattle hospitals and providing consultation to physicians on the management of bleeding, transfusion reactions and antibody related clinical issues. A PSBC physician reviews the cases

with the fellow and provides back-up. There is no in-house call. Fellows are asked to document all calls in a log, which is reviewed the next day with the attending PSBC attending on call.

Fellows spend a week with the PSBC apheresis unit, which provides apheresis services to most of the Seattle hospitals as well as outpatients. Fellows have the opportunity to observe and write orders for therapeutic apheresis procedures as well as cytoreduction and hematopoietic stem cell collection. Patient management plans are reviewed with the fellows by an attending PSBC physician and fellows have the opportunity to discuss the case with the referring physicians as well.

Fellows spend a week on the UWMC Transfusion Service during which time they have the opportunity to observe cardiopulmonary bypass, complex cardiac and vascular surgeries, and organ transplantation. Under the supervision of an attending Hematologist, the fellow works with the surgical teams in the interpretation of hemostasis testing and management of massive transfusion in the OR and critical care units. During this rotation fellows provide consultation for transfusion reactions, reviewing cases with the attending transfusion medicine physician.

Fellows have the opportunity to attend a Wednesday afternoon hemophilia clinic at PSBC with Dr. Art Thompson, Director of the Hemophilia Program. In addition, patients with bleeding and thrombotic disorders of platelets and coagulation proteins are evaluated and management plans developed. The fellows spend time in the coagulation laboratories of the PSBC learning techniques and interpretation of laboratory testing in patients with these disorders.

Fellow Responsibilities:

In the context of the above, fellows will take call two days a week and provide consultative services to the hospitals and physicians served by PSBC. The fellow will keep a log of all calls, which will be reviewed with the attending physician on call on an emergent basis or within 24 hours of the case, depending on the acuity of the clinical situation. Fellows will complete all assigned laboratory work for review by laboratory supervisory staff and supervising physicians. The fellow will present their cases at the Monday morning PSBC clinical meetings for review by the medical staff.

Attending Responsibilities:

The attending physician responsible for a laboratory or clinical service will review all work with the fellow and sign off all orders on patients undergoing procedures such as apheresis. The attending will review with the fellow the pertinent medical literature, treatment protocols and standard practice policies and advise the fellow on required and useful references and resources. Attendings taking call with the fellow will review all cases within 24 hours and on an as-needed emergent basis. Attendings of each rotation will discuss goals and objectives for the rotation at the beginning of the month and review the fellow's progress and performance at the midpoint and end of the rotation.

Schedule of Conferences:

Monday

10:00 – 11:30 a.m. PSBC Clinical Meeting. 3rd floor conference room
All clinical faculty in Transfusion Medicine and Hematology at PSBC attend this meeting of clinical case review.

Tuesday

10:00 – 11:30 a.m. Medical Staff Meeting, 3rd floor conference room.
A multidisciplinary conference where current local, national and international issues in Transfusion Medicine and their effect on local practice are discussed.

Wednesday

9:30 – 11:30 a.m. SCCA Transfusion Service meeting, SCCA Transfusion Service Office, Aloha Building at SCCA
A multidisciplinary team of doctors, nurses and laboratory technicians review transfusion related issues in the hematopoietic stem cell transplant patients of the Seattle Cancer Care Alliance.

4th Friday

7 – 8 AM Selected Topics in Hematology/Oncology Fellow's Teaching Conference* (Pelton Auditorium, FHCRC)

8 – 9 AM Hematology Grand Rounds alternate with Heme Fellow's Conference Journal Club/Case Discussion* (Pelton Auditorium, FHCRC)

10:00-11:00 PSBC monthly research conference, 3rd floor conference room
Research and clinical faculty present their current work on red cell structure, coagulation proteins, platelet transfusion and immunology, islet cell transplantation and other topics.

Fellows are asked to attend at least one Transfusion Practice Committee meeting at one of the large county, community or university hospitals. Time and location vary.

PSBC Educational Objectives:

By the completion of this rotation the fellow will be able to:

1. Demonstrate expertise in the area of red cell immunology including:
 - characteristics of the major clinically important red cell surface antigens.
 - clinical and pathological consequences of antibodies to red cells.
 - red cell matching for ABO and Rh prior to transfusion.
 - routine pretransfusion compatibility testing.
 - testing for and management of hemolytic disease of the newborn

Evaluation: In-training observation. *Veriform* end-of month global rating form filled out by a staff attending who will review and summarize written performance evaluations from laboratory personnel as well as their own observations.

2. Describe the general approach to blood collection, processing, and component preparation including:
 - Donor screening.
 - infectious disease screening tests performed on blood donors and risks of transfusion.

Evaluation: *Veriform* end-of month global rating form filled out by a staff attending.

3. Provide expert consultation in clinical transfusion medicine including:
 - clinical presentation, laboratory evaluation, and management of the various types of transfusion reactions.
 - Description of the composition and major clinical indications for whole blood, red blood cells, platelet concentrates, fresh frozen plasma, and cryoprecipitate.
 - diagnosis, pathogenesis, and management of refractoriness to platelet transfusions.
 - diagnosis, management, and treatment of platelet auto- and allo-immune disorders.
 - management of the patient with massive transfusion needs due to trauma.
 - management of the patient with special transfusion needs associated with cardiopulmonary bypass procedures.
 - management of the patient with special transfusion needs associated with organ transplantation.
 - management of the patient with special transfusion needs associated with chemotherapy and hematopoietic stem cell transplantation.
 - alternatives to allogeneic blood transfusion.

Evaluation: In-training observation. *Veriform* end-of month global rating form filled out by a staff attending who will review and summarize written performance evaluations from clinical staff as well as their own observations.

4. Understand the basic principles of apheresis including:
 - clinical indications for therapeutic cytapheresis and plasmapheresis.
 - management of apheresis procedures
 - hematopoietic stem cell collection

Evaluation: In-training observation. *Veriform* end-of month global rating form filled out by a staff attending

5. Demonstrate expertise in laboratory analysis and management of disorders of hemostasis and thrombosis including a knowledge and understanding of:
 - the role of platelets and plasma coagulation factors in hemostasis, as well as the ways in which the coagulation system is regulated.

- the principles of the common coagulation screening tests and be able to interpret their results in specific clinical situations.
- the pathophysiology and management of congenital and acquired bleeding disorders.
- clotting factor components available for the treatment of hemostatic disorders.
- laboratory diagnosis and management of coagulation inhibitors.
- the differential diagnosis, laboratory evaluation, and management of thrombophilia.
- clinical use and laboratory monitoring of antithrombotic agents.
- how to obtain a thorough and accurate history from a patient with a suspected bleeding disorder.

Evaluation: In-training observation. *Verinform* end-of month global rating form filled out by a staff attending who will review and summarize written performance evaluations from laboratory personnel as well as their own observations.

Transfusion Medicine Educational Objectives in the Context of the ACGME Core Competencies

Patient Care:

- Actively participate in management of massive transfusion events
- Evaluate transfusion reactions in hospitalized patients
- Manage apheresis procedures including plasmapheresis, cytoreduction and hematopoietic stem cell collection
- Provide consultation for appropriate blood component transfusion
- Actively participate in the management of the patient with congenital hemostatic defects
- Develop management plans for patients with ongoing transfusion needs

Medical Knowledge:

- Demonstrate expertise in red cell immunology
- Understand infectious and noninfectious risks of transfusion
- Understand pretransfusion compatibility testing
- Know indications for transfusion of red blood cells and blood components
- Know the indications for apheresis procedures
- Show an understanding of the indications for blood component modification and special attributes such as leukoreduction, irradiation and CMV screening
- Be able to appropriately order and evaluate laboratory tests for hemostatic and thrombotic disorders.

Practice-Based Learning and Improvement:

- Actively participate in teaching members of the multidisciplinary transfusion staff
- Help to develop new standards and protocols at staff and committee meetings

Interpersonal and Communication Skills:

- Actively participate in multidisciplinary team rounds in clinical transfusion
- Communicate with referring physicians regarding the transfusion needs of patients

- Work as part of a team of physicians, nurses and laboratory staff to stabilize bleeding patients
- Work with laboratory and medical staff to prioritize transfusion orders

Professionalism:

- Actively participate in discussions of patient management with referring physicians
- Take part in multidisciplinary conferences discussing new problems and approaches to their solutions.
- Work as part of a team of physicians, nurses and laboratory staff to stabilize bleeding patients

Systems-Based Practice:

- Provide consultation to physicians of patients with multiple medical problems who require transfusion management
- Evaluate patients with transfusion reactions with complicated clinical pictures
- Evaluate patients with hemostatic or thrombotic disorders

TRANSFUSION BIBLIOGRAPHY

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