

ALL YEARS

Subspecialty residents at every level are expected to treat all other members of the health care team with respect and with recognition of the value of the contribution of others involved in the care of patients and their families. The highest level of professionalism is expected at all times. Racial, ethnic or cultural slurs are never acceptable. Subspecialty residents are expected to treat others with the respect and consideration they would expect for themselves. Ego and personality conflicts are not conducive to good patient care. Long hours and the stress of practice can precipitate conflict. The subspecialty resident should be aware of the situations where this is likely to happen and try to compensate by not escalating the situation.

The subspecialty resident is expected to develop a personal program of reading. Besides the general reading in the specialty, subspecialty residents should read daily focusing on problems that they encounter in patients care or in the operating room. The subspecialty resident is responsible for reading about procedures prior to performing or assisting in their performance. Subspecialty residents are expected to attend all conferences at the service and program level. The conference program is designed to provide a didactic forum to augment the subspecialty resident's reading and clinical experience. Conferences will be supplemented with additional educational opportunities including the Resident as Teachers (RAST) curriculum and the course "Introduction to Clinical/Translational Research."

Subspecialty Resident Year 1 (PGY IV)

Individuals in the PGY IV year are closely supervised by faculty. Examples of tasks that are expected of PGY IV physicians in pediatric hematology/oncology include: acceptable performance of a hematology/oncology specific history and physical, ordering of medication and diagnostic tests, collecting and analyzing test results and communicating these to the other members of the team and faculty, obtaining informed consent for procedures, and assisting with non-invasive and invasive procedures relative to the field of pediatric hematology/oncology under supervision of the faculty or senior subspecialty residents at the discretion of the responsible faculty member. Subspecialty residents will be instructed and develop skills in bone marrow aspirates and biopsies and intrathecal administration of chemotherapy under the direct supervision of faculty. Subspecialty residents at this level will respond to consults and learn the elements of an appropriate response to consultation in conjunction with the faculty member. The subspecialty residents will be trained in interpretation and follow-up of neonatal screening tests for hemoglobinopathies. The subspecialty resident is expected to exhibit a dedication to the principles of professional preparation that emphasizes primacy of the patient as the focus for care. The first year subspecialty resident must develop and implement a plan for study, reading and research of selected topics that promotes personal and professional growth, and be able to demonstrate

successful use of the literature in dealing with patients. The subspecialty resident should be able to communicate with patients and families about the disease process and the plan of care as outlined by the attending. At all levels, the subspecialty resident is expected to demonstrate an understanding of the socioeconomic, cultural, and managerial factors inherent in providing cost effective care.

Objectives:

- To be able to provide routine care to uncomplicated patients.
- To be able to treat infections and other complications in patients.
- To be able to identify patients with complications and seek appropriate consultation.
- To be able to understand the principles of informed consent.
- To be able to recognize abnormal laboratory results and obtain appropriate consultations.
- To be able to provide emotional support to patients with life-threatening disease.
- To be able to provide instructions for newly diagnosed patients.
- To be able to diagnose patients with cancer or blood diseases.
- To be able to take proficient patient histories and conduct thorough physical examinations.
- To be able to apply physiologic support of the cancer patient including parenteral nutrition, control of nausea, vomiting, and pain.
- To be able to stage and classify tumors.
- To be able to apply multimodal therapy.
- To be able to function as an integral member of the oncology team.
- To be able to perform telephone consultations with patients who call with problems.
- To be able to maintain patient data.
- To be able to present patients in tumor board.
- To be able to perform and interpret bone marrow aspiration and biopsy.
- To be able to do lumbar punctures with evaluation of cerebrospinal fluid and injections of intrathecal medications.
- To be able to interpret microscopic peripheral blood films.
- To be able to interpret hematological laboratory diagnostic tests.
- To be able to be familiar with all aspects of chemotherapy, surgical therapy and radiation therapy.
- To be proficient in appropriate use of transfusion of all blood components and plasmapheresis.
- To have expertise in bone marrow transplantation.
- To be able to understand the epidemiology and etiology of childhood cancer.
- To be able proficient in managing terminal illness.
- To recognize and treat oncologic emergencies.
- To have identified a mentor & designed & implemented a research plan.
- To present a poster or abstract at a local or national conference.

Subspecialty Resident Year 2 (PGY V)

Individuals in the second subspecialty year are expected to perform more independently the duties learned in the first year, and may supervise the routine activities of the first year subspecialty resident (PGY IV) along with faculty supervision. PGY V subspecialty residents in pediatric hematology/oncology should be able to demonstrate continued sophistication in the acquisition of knowledge and skills and further their ability to function independently in evaluation of patient problems and developing a plan for patient care. These skills include the ability to perform and interpret bone marrow aspirates, biopsies and CSF cytospin. They will also be instructed in interpretation of peripheral blood smears and standard laboratory hematology tests including immunophenotyping, coagulation assays and hemoglobin electrophoresis. The subspecialty resident at this level should take a leadership role in teaching pediatric residents (PGY I-III) and medical students the practical aspects of patient care relating to the subspecialty and be able to explain complex diagnostic and therapeutic procedures to the patient and family. The subspecialty resident should be adept at the interpersonal skills needed to handle difficult situations. The PGY V should be able to incorporate ethical concepts into patient care and discuss these with the patient, family, and other members of the health care team. The subspecialty resident should have taken the class "Introduction to Clinical/Translational Research" and begun a research project (s) in conjunction with a faculty mentor at this stage of their training and will learn how to balance this with their reduced clinical responsibilities.

Objectives:

- To have skills described for PGY IV.
- To be able to develop and administer appropriate treatment plans for children with cancer and non-malignant blood diseases.
- To be able to manage high risk patients.
- To be able to evaluate and treat complications including bleeding and infection.
- To be able to interpret normal and abnormal laboratory results correctly.
- To be able to read bone marrow aspirate slides with complete differential counts.
- To be able to provide counseling for patients at risk for hematologic and oncologic problems.
- To be able to interpret pathology materials including flow cytometry, tissue pathology and blood banking facilities.
- To be able to interpret red cell enzyme studies and identify unusual hemoglobinopathies.
- To be able to interpret HLA typing and immuno-phentopying of blast cells and cytogenetic analysis.
- To be able to identify and diagnose and treat complex congenital and /or acquired hemostatic abnormalities.
- To be able to understand genetic abnormalities associated with various cancers and blood diseases.
- To have designed & implemented a research plan.

- To identify sources of Grant support of their research project develop preliminary data in preparation to apply for support.

Subspecialty Resident Year 3 (PGY VI)

In the third year, the subspecialty resident should be capable of managing patients with virtually any routine or complicated condition with input and supervision of the faculty. The subspecialty resident is responsible for coordinating the care of multiple patients on the pediatric hematology/oncology service. Individuals in the third subspecialty year may perform routine diagnostic and therapeutic procedures (non-invasive) without direct supervision at faculty discretion. The PGY VI can perform progressively more complex procedures (including invasive procedures) under the direct (on-site) supervision of the faculty. The PGY VI can perform most complex and high-risk procedures expected of a physician within this subspecialty with the approval and supervision of the attending physician. It is expected that the subspecialty resident be adept in the use of the literature and routinely demonstrate the ability to research selected topics and present these to the team. During the final year of training the subspecialty resident should have the opportunity to demonstrate the mature ethical, judgmental and clinical skills needed for independent practice in the field of pediatric hematology/oncology. The PGY VI will be expected to deliver formal presentations at scientific assemblies and assumes a leadership role in teaching on the service. The mores and values of the profession should be highly developed, including the expected selfless dedication to patient care, a habit of lifelong study and commitment to continuous improvement of self and the practice of medicine.

Objectives:

- To have skills described above in PGY IV and V.
- To be able to develop a hypothesis and develop a research plan to prove or disapprove a hypothesis.
- To be able to review literature and present information clearly to other professionals.
- To be able to present information about a research plan.
- To be able to have written at least two abstracts and two manuscripts relating to a research plan.
- To have presented research at a national meeting.
- To have submitted a research grant.
- Demonstration of meaningful research accomplishment as required for Sub-Board eligibility.
- To submit a Grant application in support of their research project.

APPENDIX B

Expectations for each of your rotations:

Continuity Clinic

The subspecialty resident will spend one half day each week in Pediatric Hematology/Oncology clinic throughout all 3 years of training. The half day will be taken in the afternoon during the first year of fellowship and can be moved to a different day and the morning during the 2nd and 3rd year. One half Friday each month will be spent doing the outpatient procedures. Fellows will be expected to establish a relationship and follow a diverse panel of Pediatric Hematology/Oncology patients that have presented to them on the wards or in clinic.

Objectives:

1. Medical Knowledge
 - a. Participate in fellowship core conferences and other conferences designed to provide medical knowledge specific to the discipline.
 - b. Use their fund of knowledge and the literature to generate differential diagnoses and treatment plans for patients with hematologic and malignant diseases.

2. Patient Care
 - a. Develop a diverse panel of continuity care patients.
 - b. Develop skills in managing outpatient hematology and oncology problems.
 - c. Develop skills in managing outpatient chemotherapy.
 - d. Develop skills in managing the complications of phlebotomy and blood transfusions.
 - e. Develop expertise in the management of sickle cell disease, particularly as it pertains to interpreting abnormal newborn screens, phlebotomy and transfusion, iron overload, and preventive maintenance.
 - f. Develop expertise in the management of hemophilia, particularly in terms of workup, prophylaxis, and inhibitors.
 - g. Develop expertise in management of other benign hematologic problems such as neutropenia, thrombocytopenia, and anemia.
 - h. Review and interpret peripheral smears performed on patients with hematological disorders.
 - i. Participate in chemotherapy talk with family with faculty supervision.
 - j. Participate in end of life discussion and develop plan for hospice care for continuity care patient.

3. Systems Based Practice
 - a. Work effectively within the hematology/oncology treatment team.
 - b. Manage patient problems on a long-term, continuous basis.

- c. Understand when to consult pediatric pathology, hematopathology, neuropathology, immunopathology, pediatric radiology, nuclear medicine, pediatric general surgery, neurosurgery, otolaryngology, orthopedics, urology, and transfusion medicine.
 - d. Develop an understanding and exposure to clinical research protocols, including issues related to enrollment, and ethical issues in managing patients on institutional and multi-institutional protocols.
 - e. Develop skills in working with the research office to integrate clinical research studies into the routine care of patients
 - f. Develop skills in integrating the support of the clinical social worker to address issues related to family stress, school, abuse and neglect, and financial issues.
 - g. Develop skills in integrating the support of Child Life services to prepare patients for invasive procedures or other stressful interventions.
 - h. Develop skills in interacting with nursing staff in effective ways.
 - i. Develop skills in leading the patient care team in a way that enhances the wellbeing of patients.
4. Professionalism.
- a. Be responsive to clinic staff and accountable for the care of clinic patients, including following up on laboratory results and communicating with families.
 - b. Develop collegial, constructive relationships with support services.
 - c. Manage clinical and personal responsibilities so that the patients are seen in a timely fashion.
5. Interpersonal Skills
- a. Develop skills in managing patient referrals and communicating with referring physicians both in spoken word and written language.
 - b. Develop skills in telephone advice and telephone triage.
 - c. Teach medical students and residents about hematologic and oncologic problems.
6. Practice-Based Learning and Improvement
- a. Use their fund of knowledge and the literature to generate differential diagnoses and treatment plans for patients with hematologic and malignant diseases.
 - b. Use data bases such as PubMed, the Cochran Data Base, and Curesearch Website to develop evidence treatment plans for patients.
 - c. Lead discussion regarding clinical protocols with faculty supervision.
 - d. Generate appropriate differential diagnoses and evidence based plans for their patients the majority of time.

The subspecialty resident will spend seven four-week rotations managing patients on the general pediatrics floor, newborn nursery, neonatal intensive care unit, intensive care unit with supervision of the ward attending. The fellows role and responsibilities will progressively become greater through the course of the fellowship as their knowledge, skill, and experience increases. The duties that the fellow is to perform will include directing inpatient rounds, providing follow-up for consultations, managing acutely ill patients, coordinating admissions and transfers, delivering informed consent for procedures and chemotherapy, participating in the management of patients receiving chemotherapy, and providing teaching to the students and less senior residents.

Objectives:

1. Medical Knowledge
 - a. Participate in fellowship core conferences and other conferences designed to provide medical knowledge specific to the discipline.
 - b. Use their fund of knowledge and the literature to generate differential diagnoses and treatment plans for patients with hematologic and malignant diseases.
 - c. Recognize and manage septic shock and other medical emergencies.
 - d. Effectively respond to consultations from the pediatric services, the NICU, and the PICU.
 - e. Write inpatient chemotherapy orders and recognize and manage the complications of chemotherapy.
 - f. Understand the appropriate use of surgical and radiation therapy in managing patients with malignant disease
 - g. Understand methods to provide nutrition to our patients.
 - h. Understand how to control nausea/vomiting.
 - i. Understand methods of pain management.
2. Patient Care
 - a. Develop the ability to effectively educate families and children about their diagnosis, treatment, and prognosis.
 - b. Develop skills in managing inpatient hematology and oncology problems.
 - c. Develop skills in managing inpatient chemotherapy.
 - d. Develop skills in managing the complications of phlebotomy and blood transfusions.
 - e. Develop expertise in the management of sickle cell disease, particularly as it pertains to acute crisis such as fevers, pain, sequestration, and strokes.
 - f. Develop expertise in the management of hemophilia, particularly in terms of acute and life-threatening bleeds and surgical procedures.

- g. Develop expertise in management of other benign hematologic problems such as neutropenia, thrombocytopenia, and anemia.
- h. Review and interpret peripheral smears performed on patients with hematological and oncologic disorders.

3. Systems Based Practice

- a. Function as part of a multidisciplinary team.
- b. Work effectively within the hematology/oncology treatment team.
- c. Develop effectiveness at the provision of comprehensive care for our patients.
- d. Develop skills in managing patient referrals and communicating with referring physicians both in spoken word and written language.
- e. Understand when to consult pediatric pathology, hematopathology, neuropathology, immunopathology, pediatric radiology, nuclear medicine, pediatric general surgery, neurosurgery, otolaryngology, orthopedics, urology, and transfusion medicine.
- f. Develop an understanding and exposure to clinical research protocols, including issues related to enrollment, and ethical issues in managing patients on institutional and multi-institutional protocols.
- g. Develop skills in integrating the support of the clinical social worker to address issues related to family stress, school, abuse and neglect, and financial issues.
- h. Develop skills in integrating the support of Child Life services to prepare patients for invasive procedures or other stressful interventions.
- i. Understand and integrate the role of psychology and psychiatry in the support of our patients, including the recognition and management of psychosocial stresses and problems.
- j. Develop skills in interacting with nursing staff in effective ways.
- k. Develop skills in leading the patient care team in a way that enhances the wellbeing of patients.
- l. Facilitate new patient referrals and transfers.
- m. Triage patients and provide phone advice while on call.

4. Professionalism.

- a. Be responsive to staff and accountable for the care of patients, including following up on laboratory results and communicating with families.
- b. Develop collegial, constructive relationships with support services.
- c. Manage clinical and personal responsibilities so that the patients are seen in a timely fashion.

5. Interpersonal Skills

- a. Be an effective leader of the hematology/oncology team.
 - b. Develop skills in managing patient referrals and communicating with referring physicians both in spoken word and written language.
 - c. Develop skills in telephone advice and telephone triage.
 - d. Teach medical students and residents about hematologic and oncologic problems.
 - e. Demonstrate skill in communicating and counseling patients and their parents.
6. Practice-Based Learning and Improvement
- a. Use their fund of knowledge and the literature to generate differential diagnoses and treatment plans for patients with hematologic and malignant diseases.
 - b. Use data bases such as PubMed, the Cochran Data Base, and Curesearch Website to develop evidence based treatment plans for patients.
 - c. Evaluate their performance and generate goals with program director.
 - d. Develop skills in evidence based medicine.

Outpatient Clinic Rotation

The fellow will spend a total of 2 four-week rotations in the outpatient clinic, where they will have an opportunity to see patients and interact with attendings that specialize in each of the Pediatric Hematology/Oncology areas. Clinics are organized around brain tumors, hematologic disorders (sickle cell/hemophilia), solid tumors, long-term follow-up/survivorship, and hematologic malignancies. These blocks will be in addition to their continuity care clinic experience.

Objectives:

1. Medical Knowledge
 - a. Participate in fellowship core conferences and other conferences designed to provide medical knowledge specific to the discipline.
 - b. Use their fund of knowledge and the literature to generate differential diagnoses and treatment plans for patients with hematologic and malignant diseases.
2. Patient Care
 - a. Develop skills in managing outpatient hematology and oncology problems.
 - b. Develop skills in managing outpatient chemotherapy.
 - c. Develop skills in managing the complications of phlebotomy and blood transfusions.
 - d. Develop expertise in the management of sickle cell disease, particularly as it pertains to interpreting abnormal newborn screens, phlebotomy and transfusion, iron overload, and preventive maintenance.

- e. Develop expertise in the management of hemophilia, particularly in terms of workup, prophylaxis, and inhibitors.
 - f. Develop expertise in management of other benign hematologic problems such as neutropenia, thrombocytopenia, and anemia.
 - g. Review and interpret peripheral smears performed on patients with hematological disorders.
3. Systems Based Practice
- a. Work effectively with the hematology/oncology treatment team.
 - b. Develop skills in managing patient referrals and communicating with referring physicians both in spoken word and written language.
 - c. Understand when to consult pediatric pathology, hematopathology, neuropathology, immunopathology, pediatric radiology, nuclear medicine, pediatric general surgery, neurosurgery, otolaryngology, orthopedics, urology, and transfusion medicine.
 - d. Develop an understanding and exposure to clinical research protocols, including issues related to enrollment, and ethical issues in managing patients on institutional and multi-institutional protocols.
 - e. Develop skills in working with the research office to integrate clinical research studies into the routine care of patients
 - f. Develop skills in integrating the support of the clinical social worker to address issues related to family stress, school, abuse and neglect, and financial issues.
 - g. Develop skills in integrating the support of Child Life services to prepare patients for invasive procedures or other stressful interventions.
 - h. Develop skills in interacting with nursing staff in effective ways.
 - i. Develop skills in leading the patient care team in a way that enhances the wellbeing of patients.
4. Professionalism.
- a. Be responsive to clinic staff and accountable for the care of clinic patients, including following up on laboratory results and communicating with families.
 - b. Develop collegial, constructive relationships with support services.
 - c. Manage clinical and personal responsibilities so that the patients are seen in a timely fashion.
5. Interpersonal Skills
- a. Develop skills in managing patient referrals and communicating with referring physicians both in spoken word and written language.
 - b. Develop skills in telephone advice and telephone triage.
 - c. Teach medical students and residents about hematologic and oncologic problems in a time sensitive manner in the outpatient clinic.
6. Practice-Based Learning and Improvement

- a. Use their fund of knowledge and the literature to generate differential diagnoses and treatment plans for patients with hematologic and malignant diseases.
- b. Use data bases such as PubMed, the Cochran Data Base, and Curesearch Website to develop evidence treatment plans for patients.
- c. Lead discussion regarding clinical protocols with faculty supervision.
- d. Fellows will evaluate their clinical performance and generate clinical goals with program director.

Bone Marrow Transplant

The subspecialty resident will spend three, four-week rotations of more intensive time working in the contiguous bone marrow transplant unit and outpatient clinic. The subspecialty resident will take transplant related consults from Shands Teaching Hospital including Brain Tumor patients and the Neonatal Unit. The subspecialty resident will round with both the pediatric, adult, and immunology services, and follow and manage the pediatric patients along with the attending.

Objectives:

1. Medical Knowledge
 - a. Participate in fellowship core conferences and other conferences designed to provide medical knowledge specific to the discipline.
 - b. Participate in bone marrow transplant related conferences, including biweekly transplant conferences, patient intake conferences, and weekly pediatric transplant conferences.
 - c. Use their fund of knowledge and the literature to generate differential diagnoses and treatment plans for patients with transplant-related hematologic and malignant diseases.
 - d. Understand the medical and ethical issues related to the application of hematopoietic stem cell transplant in the treatment of malignant and non-malignant diseases.
 - e. Recognize and manage septic shock and other medical emergencies.
 - f. Write chemotherapy orders and recognize and manage the complications of conditioning for transplant.
 - g. Understand the appropriate use of surgical and radiation therapy in managing patients.
 - h. Understand methods to provide nutrition to our patients.
 - i. Understand how to control nausea/vomiting.
 - j. Understand methods of pain management.
2. Patient Care.

- a. Manage acute and chronic problems related to stem cell transplant, such as graft versus host disease and infection.
 - b. Learn the indications for stem cell transplant.
 - c. Learn the processes for donor identification
 - d. Understand how stem cells are mobilized, harvested, and cryopreserved, and proper methods of infusion.
 - e. Manage transplant related complications.
 - f. Develop the ability to effectively educate families and children about their diagnosis, treatment, and prognosis.
3. Systems Based Practice
- a. Work effectively with the transplant team.
 - b. Develop skills in managing patient referrals and communicating with referring physicians both in spoken word and written language.
 - c. Understand when to consult pediatric pathology, hematopathology, neuropathology, immunopathology, pediatric radiology, nuclear medicine, pediatric general surgery, neurosurgery, otolaryngology, orthopedics, urology, and transfusion medicine.
 - d. Develop an understanding and exposure to clinical research protocols, including issues related to enrollment, and ethical issues in managing patients on institutional and multi-institutional protocols.
 - e. Develop skills in integrating the support of the clinical social worker to address issues related to family stress, school, abuse and neglect, and financial issues.
 - f. Develop skills in integrating the support of Child Life services to prepare patients for invasive procedures or other stressful interventions.
 - g. Understand and integrate the role of psychology and psychiatry in the support of our patients, including the recognition and management of psychosocial stresses and problems.
 - h. Develop skills in interacting with nursing staff in effective ways.
 - i. Develop skills in leading the patient care team in a way that enhances the wellbeing of patients.
 - j. Triage patients and provide phone advice while on call.
 - k. Function as part of a multidisciplinary team.
 - l. Develop effectiveness at the provision of comprehensive care for our patients.
4. Professionalism
- a. Be responsive to clinic staff and accountable for the care of clinic patients, including following up on laboratory results and communicating with families.
 - b. Develop collegial, constructive relationships with support services.

- c. Manage clinical and personal responsibilities so that the patients are seen in a timely fashion.
5. Interpersonal Skills
 - a. Develop skills in managing patient referrals and communicating with referring physicians both in spoken word and written language.
 - b. Develop skills in telephone advice and telephone triage.
 - c. Teach medical students and residents about hematologic and oncologic problems.
 - d. Demonstrate skill in communicating and counseling patients and their parents.
 6. Practice-Based Learning and Improvement
 - a. Use data bases such as PubMed, the Cochran Data Base, and Curesearch Website to develop evidence treatment plans for patients.
 - b. Develop a diverse panel of continuity care patients.
 - c. Evaluate their clinical performance and generate clinical goals with program director.
 - d. Develop skills in evidence based medicine.

Training in Procedures

The subspecialty resident will learn to perform common procedures such as bone marrow aspirates and biopsies, lumbar punctures with installation of chemotherapy, and skin biopsies while they are on the inpatient and bone marrow transplant services. Fellows will spend on half day every month performing outpatient procedures. Fellows are required to log all procedures. Proficiency in procedures will be evaluated by the attendings during the evaluations every 3 months. The subspecialty resident will review and interpret peripheral smears and bone marrow aspirates performed on these patients.

Hematopathology/Pathology/Cytogenetics

The subspecialty resident will spend two weeks in Hematopathology, Pathology, and Cytogenetics.

Objectives:

1. Medical Knowledge
 - a. Participate in fellowship core conferences and other conferences designed to provide medical knowledge specific to the discipline.
 - b. Participate in conferences related to pathology, hematopathology and cytogenetics.

2. Patient Care
 - a. Develop skills in interpreting peripheral blood smears, bone marrow biopsies, bone marrow aspirates.
 - b. Learn about flow cytometry and DNA ploidy analysis.
 - c. Learn about the procedures related to obtaining tissue and fixation, histochemical and immunohistochemical techniques, and analysis of tumor specimens.
 - d. Learn about karyotyping, fluorescent in-situ hybridization, polymerase chain reaction, and direct sequencing of genes as they related to the diagnosis of cancer and benign hematological diseases.

3. Systems Based Practice
 - a. Learn about the cost of various types of pathological procedures.
 - b. Learn about the appropriate use of cytogenetic techniques as diagnostics.
 - c. Understand why tests have a certain turn-around time.

Blood-Banking/Coagulation/Laboratory Medicine

The subspecialty resident will spend two weeks in blood banking/coagulation/laboratory medicine.

Objectives:

1. Medical Knowledge
 - a. Participate in fellowship core conferences and other conferences designed to provide medical knowledge specific to the discipline.
 - b. Participate in conferences related to pathology, hematopathology and cytogenetics.

2. Patient Care
 - a. Understand the procedures related to typing and crossmatching blood, transfusion reactions, and product storage.
 - b. Learn about issues related to alloimmunization and how to prevent it.
 - c. Learn about the indications for irradiation, filtration, washing, and observe and participate in these procedures.
 - d. Understand how to perform and interpret the variety of assays related to coagulation.

3. Systems Based Practice
 - a. Learn about the cost of blood products.
 - b. Learn about the importance of accurate patient identification and processes to insure matching of blood products and correct patients.

Radiation Therapy

The subspecialty resident will spend two weeks with the radiation therapy team.

Objectives:

1. Medical Knowledge
 - a. Participate in fellowship core conferences and other conferences designed to provide medical knowledge specific to the discipline.

2. Patient Care.
 - a. Learn the indication for radiation therapy for children and adolescents.
 - b. Learn how radiation therapy is integrated into combined modality treatments.
 - c. Learn about different radiation techniques.
 - d. Learn about radiation side effects, and techniques to minimize side effects.
 - e. Learn about tissue specific dose considerations.

3. Systems Based Practice
 - a. Learn about the cost of various types of radiation procedures.
 - b. Learn about the appropriate time to consult radiation therapists.
 - c. Learn about proton beam radiation and methods of identifying appropriate candidates.

Adult Hematology/Oncology

The subspecialty resident will spend two weeks in Hematopathology, Pathology, and Cytogenetics.

Objectives:

1. Medical Knowledge
 - a. Participate in fellowship core conferences and other conferences designed to provide medical knowledge specific to the discipline.

2. Patient Care
 - a. See patients with pediatric conditions and how it is managed in an adult setting
 - b. Learn the management of anticoagulation in an adult setting
 - c. See adult tumors that are occasionally seen in children
 - d. Learn the management of diseases that are seen in both adults and children such as ITP, hemophilia, and sickle cell disease.

3. Systems Based Practice
 - a. Learn about the models of transition from pediatrics to adulthood in patients with lifelong chronic conditions.

Palliative Care

The subspecialty resident will participate in weekly Pediatric Palliative Care educational activities, as well as a dedicated two week elective rotation.

Objectives:

1. Medical Knowledge
 - a. Participate in fellowship core conferences and other conferences designed to provide medical knowledge specific to the discipline.
 - b. Fellows will learn what is Palliative Care and why does it matter.
 - c. Fellows will participate in Pediatric Palliative Care weekly educational conferences and psychosocial rounds designed to integrate and enhance application of palliative care principles in caring for patients and their families.
 - d. Fellows will understand life-threatening illness and specific palliative care needs at each developmental stage.
 - e. Fellows will learn thorough symptom management (i.e pain, nausea, fatigue, dyspnea, depression, delirium) by using both pharmacologic and non-pharmacologic integrative approaches
 - f. Fellows will have access to web-based palliative care self-instruction teaching modules
2. Patient Care
 - a. Fellows will work with hospital based, pediatric oncology specific, consultation service
 - b. Fellows will be able to get a detailed and meaningful psychosocial, spiritual and cultural history that will help deliver palliative care services according to needs of patient and family
 - c. Fellows will develop communication skills, specifically in the following scenarios and difficult conversation topics:
 1. Breaking bad news
 2. Discussing prognosis and patient centered goals of care
 3. Discussing “Voicing my Choices” advance directive with patients
 4. Communication with families at the end of life
 5. Allowing natural death

- d. Fellows will be able to identify cases that merit Ethics review
 - e. Fellows will learn self-care to prevent burn out and compassion fatigue
3. Systems Based Practice
 - a. The fellows will learn how palliative care help avoid costs in caring for the seriously ill and dying
 - b. The fellow will learn appropriate use of Integrative Services such as Child Life, social work, chaplain, physical therapy, Arts in Medicine and volunteer services (Streetlight, Footprints).

Research

Each fellow will develop a formal research project which will be their primary focus during the second and third year of fellowship. The subspecialty resident will be expected to identify a mentor and begin organizing a research project during the first year of fellowship. Time will be provided during the subspecialty elective rotations to identify a mentor and begin planning a research project. All subspecialty residents will be expected to engage in projects in which they develop hypotheses or in projects of substantive scholarly exploration and analysis that require critical thinking. Areas in which research may be pursued include, but are not limited to: basic, clinical, or translational biomedicine; health services; quality improvement; bioethics; education; and public policy. Fellows must gather and analyze data, derive and defend conclusions, place conclusions in the context of what is known or not known about a specific area of inquiry, and present their work in oral and written form to their Scholarship Oversight Committee (see below) and elsewhere.

All fellows will participate in the two week Clinical Research Center's short course entitled "Introduction to Clinical/Translational Research". This course includes ten three-hour didactic sessions over two weeks, and consists of didactic lectures and small group sessions covering the following topics:

1. Biostatistics
2. Clinical research methodology
3. Preparation of applications for funding
4. Critical literature review
5. Principles of evidence-based medicine
6. Ethical principles of research
7. Laboratory research methodology

During this course, the participants will develop a patient oriented research proposal, which will be formally reviewed and critiqued by the program leaders. Goals for this program include:

Objectives:

1. Develop skills in organizing and carrying out a research project.
2. Develop skills in biostatistical methods.
3. Develop knowledge and understanding of research ethics, and perform research projects in an ethical way.
4. Develop skills in grant writing.
5. Develop skills in writing research manuscripts.
6. Develop an area of focus and expertise.
7. Develop skills in presenting research data by lecture or poster.
8. Develop understanding of how to critically read biomedical literature, as it relates to study design and bias.

Fellows who choose a **clinical track** are expected to write a Master's thesis that summarizes their activities during their research years. They will participate in the NIH funded Advance Post-graduate Program in Clinical Investigation, where they will complete a Master's Degree in Public Health or a Master's Degree in Clinical Research. Goals for this program include:

Objectives:

1. Manuscript and Abstract Writing for the Clinician/Scientist.
2. Biostatistics
3. Analysis of Research Data
4. Grant Writing
5. Scientific Writing for Publications and Grants
6. Ethical and Policy Issues in Clinical Research
7. Principles of Epidemiology
8. Practical Issues in Design and Data Collection

The Scholarship Oversight Committee, in conjunction with the trainee, the mentor, and the program director will determine whether a specific activity is appropriate to meet the ABP guidelines for scholarly activities. In addition to biomedical research, examples of acceptable activities might include a critical meta-analysis of the literature, a systematic review of clinical practice with the scope and rigor of a Cochrane review, a critical analysis of public policy relevant to the subspecialty, or a curriculum development project with an assessment component. These activities require active participation by the subspecialty resident and must be mentored. The mentor(s) will be responsible for providing ongoing feedback essential to the trainee's development.

Fellows who choose a **basic science track** will develop a specific research program in consort with their mentor. The mentor and the scholarship oversight committee will



identify specific courses which the fellow will audit. Fellows will be expected to present their research progress at least once a year to the division.

A timeline and milestone guide for the research may be as follows:

Year 1:

- A. Interview with different labs and PI (mentors) based on your interests
- B. By the end of 1st year, designate a lab, mentor and potential projects

Year 2:

- A. Develop hypothesis(es)
- B. Build/Develop a model
- C. Develop experimental details
- D. Establish preliminary data
- E. Write an abstract suitable for presentation at a National Conference
- F. Identify potential sources of grant support

Year 3:

- A. Develop enough project data for publication
- B. Write and submit if a grant supporting the project
- C. Decide if further research year is desired and develop a plan for this