College of Medicine
Health Science Center
Department of Pediatrics
Division of Pediatric Hematology/Oncology

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Pediatric Hematology/Oncology Program Description

Program Demographics:

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Current Training Faculty:

Tung Wynn, M.D.	Program Director
William Slayton, M.D.	Associate Professor & Chief
Vandy Black, M.D.	Clinical Assistant Professor
Paul Castillo, M.D.	Clinical Assistant Professor
John Fort, M.D.	Associate Professor
Joanne Lagmay, M.D.	Clinical Assistant Professor
Elias Sayour, M.D.	Assistant Professor

Introduction:

The Pediatric Hematology/Oncology Fellowship program at the University of Florida/Shands Hospital was established in the late 80's and has graduated approximately 30 graduates. It was re-established in 2004 and has graduated 5 fellows since that time. It is fully accredited by the American Council of Graduate Medical Education (ACGME) as a pediatric subspecialty. The Pediatric Hematology/Oncology Division consists of faculty appointed in the Department of Pediatrics. We participate in the NRMP and candidates are eligible who are trained in an ACGME accredited Pediatric Residency Program and will have completed their residency training by the start of the Fellowship.

The objective of the program is to train candidates for careers in academic pediatric hematology/oncology. Specifically, our program is designed to develop the skills necessary to provide state-of-the-art patient care, and to develop skills in research that will allow the subspecialty resident to contribute to the progress of the field of Pediatric Hematology/Oncology. Our curriculum has been designed to train subspecialty residents according to the six major competencies as outlined by the ACGME (see attached curriculum). A minimum training period of three years is required for the American Academy of Pediatrics Sub-Board of Pediatric Hematology/Oncology. Tracks are available to the fellow who is interested in basic science research as well as one for the fellow who is interested in clinical research. Additional training is available for those undertaking a supported research program.

Overview:

The first-year is mainly clinically oriented with a survey of possible research areas. The second and third year have mainly a research focus, with continued but limited clinical responsibilities.

First Year of Subspecialty Residency:

- Develop skills in diagnosis and management of problems in Pediatric Hematology/Oncology.
- Develop skill in the diagnosis and management of problems related to stem cell transplantation and the indications for transplant.
- Develop expertise in prescribing chemotherapy safely.
- Develop skills in bone marrow aspirations, bone marrow biopsies, lumbar punctures with intrathecal administration of chemotherapy, and skin biopsies.
- Develop skills in interpreting laboratory results, peripheral blood smears, bone marrow aspirates and biopsies.
- Identify a research mentor and a research project related to Pediatric Hematology/Oncology.
- Complete at least one clinical project for presentation and publication during the third year of subspecialty residency.

Second Year of Subspecialty Residency:

The subspecialty resident will continue to follow patients in continuity care clinic and will be on-call one night per week and one weekend a month. The first two months of the 2nd year will be devoted to subspecialty electives as described below. The major emphasis the second year will be on research. The subspecialty resident will develop a research project in conjunction with a mentor. Subspecialty residents who wish to focus on a career in clinical research will be expected to participate in the Advanced Postgraduate Program in Clinical Investigation where they will receive a Master of Science in Clinical Investigation or a Master of Public Health. Subspecialty residents who are interested in the basic science track can take “The Science of Clinical Research” which is offered in the fall through the General Clinical Research Center.

Third Year of Subspecialty Residency:

The subspecialty resident will continue to follow patients in continuity care clinic and will be on-call at night once weekly and one weekend a month. The subspecialty resident will present their research at a national meeting and write a research manuscript. The major emphasis in the third year will be on research.

Training in Procedures:

The subspecialty resident will learn to perform common procedures such as bone marrow aspirates lumbar punctures with installation of chemotherapy, and skin biopsies. Fellows will spend at least 1 day per month performing procedures during the first year of fellowship, and 1 day per 2 months during the second and third year. 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.

Additional Years of Subspecialty Residency:

Additional years of research training are available to those subspecialty residents who wish to continue to pursue their research goals based on funding availability.

Evaluations:

Clinical:
Fellows will be evaluated by the attendings at least every 3 months. Fellows will also undergo a 360 degree evaluation every six months. Fellows will participate in the yearly in service examination.

Research:
Subspecialty residents will be present their project to their scholarship oversight committee (SOC) prior to the start of their research project, and then at least every six months. Subspecialty residents will receive feedback from their SOC. At the end of their fellowship, Subspecialty Residents will be expected to have a written summary of their research activity that qualifies as scholarly activity per the American Board of Pediatrics. The subspecialty resident will receive formal feedback regarding their written project from their SOC.

Methods of Evaluation:

1. Evaluation of subspecialty residents

    a. Fellow's progress will be monitored at monthly faculty meetings, and problems addressed with fellows at regular meetings with the fellows. Formal evaluations occur twice per year. A written evaluation of the subspecialty resident that focuses on the six core competencies is completed by supervising attendings physician at the end six months. Furthermore, fellows will be evaluated by nurses, social workers, and other support staff as part of a 360 degree evaluation every six months. The training program director will provide a written summary of these evaluations to the

subspecialty resident twice a year, and will verbally review this performance. Written records are kept on all evaluations.

b. The written evaluation forms specifically evaluate the subspecialty residents' skills, both procedural and conceptual. These are important components of the evaluation, and successful skill acquisition is required for program completion.

c. The Pediatric Hematology/Oncology training program has developed specific forms to evaluate subspecialty residents that are based on forms developed by the Department of Pediatrics. These forms emphasize the six core competencies. The Subspecialty training program director meets regularly with the Directors of other subspecialty training programs in the Department of Pediatrics. We will track the acquisition of skills over time to insure that skills improve through feedback and discussion with the subspecialty resident.

d. With the help of the Program Director, each subspecialty resident will identify a mentor/advisor by the end of year 1. Then, a scholarship oversight committee will be organized to help the subspecialty resident develop their research project. The subspecialty resident will present their research project to the oversight committee at the beginning of year two, and will meet every six months thereafter. This advisor will meet with the subspecialty resident on a regular basis.

e. All evaluations are retained for each subspecialty resident in a file of trainees. This is kept in New Innovations. A final written evaluation is completed at the end of three years of training and kept on file. This is available for release to prospective employers at the request of the trainee provided that he/she provides a signed, written request.

f. A portfolio of the subspecialty resident's written work, printouts of power point presentations, and copies of grant submissions will be assembled and kept to document the achievement of specific objectives as outlined in the curriculum.

2. Evaluation of faculty

a. All subspecialty residents are requested to evaluate each faculty member twice yearly using a standardized online form that is anonymous. Pediatric residents complete similar forms. These forms evaluate clinical care and teaching and provide opportunities for constructive criticism. The pediatric resident and subspecialty resident evaluations are collated annually and summarized in the formal, end of year written evaluation received by each faculty member. This evaluation also includes a formal assessment of scholarly activity and productivity prepared by the Division Chief and/or Department Chair.

b. As per 2a above. Subspecialty residents complete formal, anonymous evaluations on-line.

3. Evaluation of program

a. The training program is evaluated regularly. Subspecialty residents meet with the training program Director every month to discuss issues and provide feedback regarding strengths and weaknesses of the program. The training program is a regular topic at monthly faculty meetings. Annually there will be a formal evaluation of the fellowship program, where faculty and subspecialty residents review the rotations, objectives, and policies of the fellowship program and provide feedback. This results in a summary action statement that is reviewed and approved by the faculty. Specific points considered are whether or not educational goals are met, the quality of the curriculum, the needs of the subspecialty residents and clinical and research responsibilities of faculty members.

b. These reviews are used by the program director to identify areas that need to be strengthened. Changes will be made to address program deficiencies and/or significant concerns.

Summary:

YR-1

Block (4 weeks)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	
Rotation	Inpatient (7)							Outpatient (2)		BMT (3)			Subspecialty *	Vacation 3 wks
Percent Outpatient								80	80				60	
Percent Research								20	20				40	

***Scholarly Activity (Research Mentor Interviews and Planning)**

YR-2

Block (4 weeks)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	
Rotation	ǂ	Subspecialty*	Research										Inpatient	Vacation 3 wks
Percent Outpatient	60	60												
Percent Research	40	40	100	100	100	100	100	100	100	100	100	100		

ǂThe Science of Clinical Research (2 weeks)

YR-3

Block (4 weeks)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	
Rotation	Research												Inpatient	Vacation 3 wks
Percent Outpatient														
Percent Research	100	100	100	100	100	100	100	100	100	100	100	100		

All rotations are within Shand's Hospital at University of Florida

■ Vacation time restricted; No vacation during inpatient blocks.

*Subspecialty Blocks:

- Blood Bank/Coagulation
- Adult Hematology/Oncology
- Radiation Therapy
- Hematopathology
- Hospice

** *Subspecialty blocks allow flexible time in which fellows can identify and Interview potential research mentors. During the 10 weeks, fellows will identify mentor and develop a research project idea. Fellows will work with the program director and mentor to identify members of their scholarship oversight committee.*

***Vacation can be taken within any non-restricted block with prior approval from program director.

Curriculum

Fellowship Program, Pediatric Hematology Oncology
University of Florida

The following curriculum has been developed to address the six general competencies as they apply to the field of Pediatric Hematology/Oncology. Tools to evaluate the objectives listed in this curriculum are summarized in Table 1 which is attached.

Subspecialty residents will develop a portfolio of items that will serve as documentation of achievement of certain of these objectives, as described below:

1. Patient Care Skills

A. Caring and respectful behaviors

Subspecialty residents will be expected to model caring and respectful behaviors toward their patients and families. Measures of these behaviors will include direct observation and evaluation by faculty, subspecialty resident teaching evaluations, and patient surveys.

B. Interviewing

Subspecialty residents will learn how to take a history with a hematology/oncology focus. The subspecialty resident will observe faculty taking histories, and work in close association with faculty members who will assess their history taking skills. Measures of interviewing will include direct observation and faculty evaluations.

C. Informed decision making,
D. Develop and carry out patient management plans

In order to develop a fund of knowledge that will allow the subspecialty resident to have informed decision making and develop and carry-out patient management plans, the subspecialty resident will be expected to read daily about his or her patients. In addition, subspecialty residents will participate in a monthly series of didactic lectures that will make up the core curriculum. See attached Core Curriculum

Achievement of these objectives will be measured by yearly ACGME in-service exams, patient surveys, direct observation, and faculty evaluation.

E. Counsel and educate patients and families

Subspecialty residents are expected to develop the knowledge and skills that will allow them to counsel and educate patients and families about their illness. Subspecialty residents will

observe faculty and support staff counseling patients about various aspects of disease, and will counsel patients themselves during patient care interactions. We expect our subspecialty residents to have reviewed the written materials we give to patients for the various diseases we treat, and to revise, develop, or find written materials for a disease that they are interested in. These handouts will become part of the subspecialty resident's portfolio. Skills in counseling will be measured by direct observation and evaluation by faculty, residents and patients.

F. Performance of procedures

Subspecialty residents will learn to perform physical exams and procedures from the faculty and support staff. Measures will include a procedure log, direct observation and evaluation.

G. Work within a team

Subspecialty residents will be expected to work well within our team. Interpersonal skills will be evaluated by direct observation, and by subspecialty resident and faculty surveys.

2. Medical Knowledge

A. Investigatory and Analytic Thinking

The subspecialty resident will be taught how to perform literature searches, how to search the Children's Oncology Group website, and how to evaluate research papers in order to develop treatment plans for their patients. The subspecialty resident will identify a clinical or laboratory based research project. He/she will develop a research proposal that he/she will present to the Academic Oversight Committee at the beginning of year two for review and approval. The subspecialty resident will be expected to write research papers and submit a research grant during their fellowship. Subspecialty residents will present their research progress during quarterly research conferences of the division. Abilities in this area will be measured by direct observation, faculty evaluation, and external review. Research papers and grants will become part of the subspecialty resident's portfolio.

B. Knowledge and Application of Basic Science

The subspecialty resident is expected to develop a knowledge base and learn to apply principles of basic science to the care of their patients. Some subspecialty residents will develop a research project at the end of the first year of fellowship that will be carried out in a basic science laboratory. Other subspecialty residents will perform clinical research projects that use basic science concepts to improve patient care. Abilities in this area will be measured by direct observation, faculty evaluation, and external review. Research papers and grants will become part of the subspecialty resident's portfolio.

3. Practice-based Learning and Improvement

A. Analyze own practice for needed improvements

The subspecialty resident will be expected to critically evaluate his clinical practice and make a formally propose a solution to an identified problem. This evaluation will be presented at one of our monthly clinical care conferences. A written outline of this problem and proposed solution will become part of the subspecialty resident's portfolio. Subspecialty residents will organize and participate in quarterly divisional Morbidity and Mortality conferences. They will also participate in monthly Clinical Care Conferences where we will discuss and develop clinical pathways.

B. Use of evidence from scientific studies

The subspecialty resident will learn to critically read scientific studies and how to apply scientific findings to clinical practice. Subspecialty residents will participate in the College of Medicine's yearly fellowship conference which includes lectures on how to read scientific articles. The subspecialty resident will choose a particular clinical problem, and develop a clinical pathway for treating this problem using a scientific review of the literature. Skills in this area will be assessed by written evaluation by the faculty. The clinical pathway will be part of the subspecialty resident's portfolio.

C. Application of research and statistical methods

The subspecialty resident will participate in monthly journal club where they will read and evaluate an article for the faculty. Article summaries from journal club and will become part of the subspecialty resident's portfolio. See B.

D. Use of information technology

The subspecialty resident will be expected to be competent in using the latest information technology and apply these tools to his or her practice. These tools will be used on a daily basis in patient care and research. This objective will be measured by direct observation and written evaluation.

E. Facilitate the learning of others

The subspecialty resident will participate in divisional journal clubs, teaching rounds and conferences. The subspecialty resident will be expected to lead teaching rounds. By the third year, the subspecialty resident will develop a formal talk for the subspecialty residents that will be presented at their core curriculum. This objective will be measured by direct observation and written evaluation by the faculty and subspecialty residents.

4. Interpersonal and Communication Skills

A. Creation of therapeutic relationships with patients

Subspecialty residents will learn and be evaluated on their ability to create therapeutic relationships with their patients through observation of faculty. Subspecialty residents will interact with divisional social workers and support staff and develop strategies to improve

relationships when problems arise. This objective will be measured by direct observation and by written evaluations by faculty, nurses, pediatric residents, medical students and patients.

B. Listening skills

Subspecialty residents will be expected to listen to and understand the concerns of their patients and coworkers. Subspecialty residents will be evaluated in this area by direct observation and by written evaluation by faculty and patients.

5. Professionalism

A. Respectful, altruistic

Our subspecialty residents are expected to treat their patients, families, and colleagues with respect. Our subspecialty residents are expected to be altruistic. Subspecialty residents will be evaluated in this area by direct observation and written evaluation by faculty, subspecialty residents, and patients.

B. Ethically sound practice

Our subspecialty residents are expected to conduct themselves and practice medicine ethically. Ethical concerns related to patient care will be discussed with faculty members and in some cases referred to ethics committee for formal review. Once during the three years, during our monthly clinical care conference, the subspecialty resident will present an ethical dilemma and possible approaches to it and an outline of this talk will become part of the subspecialty resident's portfolio. Subspecialty residents will be evaluated by direct observation and written evaluation by faculty, subspecialty residents and patients.

C. Sensitive to cultural, age, gender, and disability issues

The subspecialty resident is expected to be sensitive to issues related to culture, age, gender and disability, and will not discriminate against patients, their families, or members of the team based on these or other issues. Subspecialty residents will be evaluated by direct observation and written evaluation by faculty, subspecialty residents, nurses and patients.

6. System-Based Practice

A. Understand the interaction of our practice within the larger system

The subspecialty residents will develop an understanding of our practice within the larger system. They will do this by responding to consultations, receive instruction in billing and compliance issues (though they will not be involved in generating bills), and be encouraged to be involved in the decision making structures of the department. Subspecialty residents will be evaluated on this objective by direct observation and written evaluation by faculty.

B. Develop knowledge of practice and delivery systems

The subspecialty residents will develop knowledge of practice and delivery systems through patient transfers and interactions with physicians from other institutions. Subspecialty residents will be evaluated by direct observation and formal faculty evaluation.

C. Practice cost-effective care

Subspecialty residents will learn the costs of our treatments through participation in our clinical care conferences. As described above, subspecialty residents will develop a clinical pathway for a clinical problem of their choice, and will include a cost-analysis of the various treatment options within the pathway. This analysis will become part of the subspecialty resident's portfolio. In addition, subspecialty residents will participate in our monthly clinical care conferences, where we discuss common clinical problems and come up with cost-effective solutions. Subspecialty residents will be evaluated by direct observation and formal faculty evaluation.

D. Advocate for patients within the health care system

Subspecialty resident will be expected to advocate for their patients as they undergo their treatments. Subspecialty residents will follow a group of patients in clinic and serve as their primary hematologist/oncologist through their fellowship. Subspecialty residents will be expected to help their patients manage issues related to disability, school, home life, depression, as they relate to the treatment. Achievement of this objective will be determined by direct observation and evaluation by faculty as well as patient evaluations.

Hematology/Oncology Fellows Core Curriculum
Didactic Lecture Series

1. Acute Lymphocytic Leukemia
    i. Genetic Mechanisms
    ii. Chemotherapy
    iii. CNS treatment
    iv. Bone marrow transplant
    v. Sequella of treatment
    vi. New diagnostic techniques/genetic testing

2. Acute Myelogenous Leukemia
    i. Genetic Mechanisms
    ii. Chemotherapy
    iii. Bone marrow transplant
    iv. Sequella of treatment
    v. New diagnostic techniques/genetic testing

3. Lymphomas
    i. Classification Hodgkin's Disease vs Non-Hodgkin's lymphoma
    ii. Genetic Mechanisms

iii. Staging
iv. Treatment approaches
v. Sequella of treatment
vi. New diagnostic techniques/genetic testing

4. Myeloproliferative Disorders and Myelodysplasia
    i. Chronic Myelogenous Leukemia
    ii. Transient myeloproliferative disorder of childhood
    iii. Leukemoid reactions
    iv. Treatment considerations
    v. Myelodysplasia
    vi. Treatment considerations
    vii. New diagnostic techniques/genetic testing

5. Bone Tumors
    i. Osteosarcoma
    ii. Ewing Sarcoma
    iii. Benign Bone Tumors
    iv. Pathophysiology
    v. Principles of Treatment (Local Control/Chemotherapy)
    vi. Amputation and loss of function
    vii. Sequella of treatment
    viii. New diagnostic techniques/genetic testing

6. Brain Tumors
    i. Signs and symptoms
    ii. Anatomic Sites
    iii. Common Tumors
    iv. Treatment Considerations
        1. Medulloblastoma
        2. Pilocytic Astrocytoma
        3. Tumors associated with NF-1
        4. Glioblastoma Multiforme
    v. Treatment Considerations
    vi. Radiation Therapy
    vii. Sequella of treatment
    viii. New diagnostic techniques/genetic testing

7. Bone Marrow Failure
    i. Idiopathic Aplastic Anemia
    ii. Congenital Bone Marrow Failure Syndromes
    iii. Pathophysiology
    iv. Treatment Approaches
    v. New diagnostic techniques/genetic testing

8. Bone Marrow Transplantation
    i. HLA and Tissue Typing

ii. Types of transplant
iii. Indications for transplant
iv. Graft versus tumor effects
v. Infectious considerations
vi. Graft versus host disease
vii. Venoocclusive Disease
viii. Long-term sequella
ix. New diagnostic techniques/genetic testing
x. New diagnostic techniques/genetic testing

9. Hemoglobinopathies
    i. Sickle Cell Anemia
    ii. Thalassemia
    iii. Other hemoglobinopathies
    iv. Embryology of hemoglobin switching
    v. Pathophysiology
    vi. Complications of hemoglobinopathies
    vii. Treatment considerations
    viii. Long-term consequences of hemoglobinopathies
    ix. New diagnostic techniques/genetic testing

10. Inherited and acquired disorders of the red cell membrane and red cell metabolism
    i. Hereditary spherocytosis/elliptocytosis
    ii. Red-cell enzyme defects
    iii. Anatomic sites of hemolysis
    iv. Pathophysiology
    v. Working up the cause of hemolysis
    vi. Treatment (Splenectomy vs Medical)
    vii. New diagnostic techniques/genetic testing

11. Autoimmune Hemolytic Anemia
    i. Warm vs Cold-antibody mediated
    ii. Pathophysiology
    iii. Treatment

12. Nutritional Anemia
    i. Vitamin deficiencies (B12, folate)
    ii. Iron Deficiency Anemia
    iii. Pathophysiology of nutritional anemias
    iv. Workup of nutritional anemias
    v. Treatment

13. Inherited and acquired disorders of white blood cells
    i. Inherited Disorders of neutrophils
        1. Kostmann's disease
        2. Schwachmann-Diamond Syndrome
        3. Myelokathexis

4. New diagnostic techniques/genetic testing

ii. Acquired Disorders of Neutrophils
    1. Autoimmune Neutropenia
    2. Alloimmune neutropenia
    3. Chronic Granulomatous Disease
    4. New diagnostic techniques/genetic testing

iii. Inherited Disorders of Lymphocytes
    1. T-cell immunodeficiencies (SCID, Wiskott-Aldrich Syndrome, DiGeorge syndrome)
    2. B-cell immunodeficiency (Bruton's Agammaglobulinemia, Hyper-IgE, IgA deficiency)
    3. New diagnostic techniques/genetic testing

iv. Acquired Disorders of Lymphocytes
    1. HIV
    2. Solid Organ Transplantation
    3. Effects of chemotherapy.
    4. Bone marrow transplant
    5. New diagnostic techniques/genetic testing

v. Disorders of Eosinophils/Mast Cells
    1. Workup of hypereosinophilia
    2. Sequella of disorder eosinophil production
    3. Mastocytomas
    4. Mast-cells and allergy
    5. New diagnostic techniques/genetic testing

14. Platelet Disorders
    i. ITP
    ii. Amegakaryocytic thrombocytopenia
    iii. Inherited disorders of platelet function
    iv. Treatment of platelet disorders
    v. New diagnostic techniques/genetic testing

15. Hemophilia
    i. Biology of the Clotting Cascade
    ii. Hemophilia A
    iii. Hemophilia B
    iv. Workup of clotting disorders
    v. Rare hemophilia's
    vi. Sequella of hemophilia (joint rehabilitation, psychosocial sequella)
    vii. Treatment of hemophilia

viii. New diagnostic techniques/genetic testing

16. Hematologic disorders of the newborn
    i. Anemia
    ii. Thrombocytopenia
    iii. Neutropenia/Neutrophilia
    iv. Leukocytosis
    v. Transient Myeloproliferative Disorder

17. Transfusion Medicine
    i. Risks of Transfusion
    ii. Indications for transfusion
    iii. Mechanism of collecting blood products
    iv. Transfusion reactions
    v. Cost of various blood products

18. Hemoglobin and Iron Metabolism
    i. Hemoglobin switching and embryology
    ii. Structure of hemoglobin
    iii. Heme synthesis
    iv. Disordered globin synthesis (thalassemia, unstable hemoglobin)
    v. Disordered heme synthesis (porphyria)
    vi. New diagnostic techniques/genetic testing

19. The Phagocytic System
    i. Anatomy of the reticuloendothelial (phagocytic) system
    ii. Splenic Function
    iii. Disorders of phagocytes
    iv. New diagnostic techniques/genetic testing

20. Cell Kinetics
    i. Chemistry of the cell cycle
    ii. Measuring the cell cycle
    iii. Mutations of cell cycle proteins and cancer
    iv. Apoptosis and Cancer
    v. New diagnostic techniques/genetic testing

21. Immunology
    i. Normal immune function
    ii. Disordered immunity and cancer
    iii. Immunosuppressive drugs
    iv. Transplant and the immune system
    v. New diagnostic techniques/genetic testing

22. Genetics
    i. Oncogenes
    ii. Genetic syndromes and cancer

iii. Mechanisms of oncogenesis
    1. Tumor suppressor genes
    2. Imprinting
    3. Loss of heterozygosity
    4. Methylation

23. Principles of Radiation Therapy
    i. Types of radiation
    ii. Principles of dosing
    iii. Site-specific side effect
    iv. Indications for radiation therapy
    v. Treating radiation-related complications

24. Blood Groups
    i. Major Blood Groups
    ii. Minor Blood Groups
    iii. Blood typing and cross match
    iv. Issues related to chronic transfusion
    v. Transfusion reactions

25. Pharmacology of Chemotherapy
    i. Classes of chemotherapy
    ii. Mechanisms of action
    iii. Targeted therapies
    iv. Management of side-effects of chemotherapy

26. Infection in Immunocompromised Patients
    i. Effects of immunosuppression
    ii. Common pathogens from various anatomic sites
    iii. Work-up of fever and neutropenia
    iv. Treatment of infection

27. Nutrition
    i. Cancer and nutrition
    ii. Antioxidants
    iii. Effects of chemotherapy
    iv. Enteral Feeding
    v. Hyperalimentation
    vi. Effects of treatment on growth

28. Principles of supportive care, palliative care & pain control
    i. Talking to patients (and parents) about cancer
    ii. Psychological needs of cancer patients
    iii. The pathophysiology of pain
    iv. Treatment of mucositis
    v. Prevention and treatment of constipation
    vi. Prevention and treatment of nausea

vii. Palliative and terminal care

29. Oncologic Emergencies
    i. Recognizing Oncologic Emergencies
    ii. Keys to management of Oncologic Emergencies

30. Psychological Effects of Cancer, Chronic Disease, and Treatment
    i. Recognize the psychological effects of life threatening illness on children
    ii. Recognize the developmental differences in psychological response to illness
    iii. Recognize the effect of chronic illness on family dynamics

31. Clinical Trial Design and Interpretation
    i. Understand different types of clinical trial design
    ii. Understand concepts of sensitivity, specificity, and power
    iii. Understand how to interpret clinical trial results, and critically evaluate trial design.

32. Characteristics of Malignant Cells
    i. Tumor histology
    ii. Common molecular pathways
    iii. Cell Kinetics
    iv. Apoptosis
    v. Cell adhesion and Metastasis

33. Microbiology and anti-infective agents in the compromised host.
    i. Barriers to infection
    ii. Innate and definitive immunity
    iii. Common pathogens in cancer patients
    iv. Common pathogens in BMT
    v. Antibiotic mechanisms of action
    vi. Mechanisms of antibiotic resistance

Lines of Supervision for Pediatric Hematology/Oncology Fellows

1. The Pediatric Hematology/Oncology attendings are ultimately responsible for all aspects of patient care.

2. The Pediatric Hematology/Oncology supervise the Pediatric Hematology/Oncology subspecialty residents in performance of all procedures, such as bone marrow aspirates, bone marrow biopsies, and lumbar punctures.

3. The Pediatric Hematology/Oncology attending is ultimately responsible for supervising care delivered by intern and resident physicians. As subspecialty residents progress, they may at times conduct rounds with the housestaff without direct faculty supervision. Immediately after these rounds, however, the subspecialty resident will review with the attending decisions made during the rounds. This will provide the attending with an understanding of the subspecialty resident's capability in independent decision making. The Pediatric Hematology/Oncology subspecialty residents may evaluate patients with residents. The subspecialty residents may evaluate the residents.

4. The Pediatric Hematology/Oncology attending is ultimately responsible for supervising care delivered by physician assistants and nurse practitioners. The subspecialty resident may deliver care in collaboration with the PA's and PNP's.

5. Problems related to the training program/education should be referred to the Program Director.

6. Problems related to staff or patient care should be referred to the Division Chief.

Updated 3/29/2016

3/29/16

Tung Wynn, MD
Program Director