Pediatric Hematology/Oncology Clerkship

A. Objectives:

General Objectives:

During the time spent with the Pediatric Hematology/Oncology Service, the student should become familiar with the following topics. This will be through a combination of patient care in the in-patient service, participation in various clinics and attendance of regularly scheduled rounds and as well as with discussion with the staff on service.

- Basic interpretation of the complete blood count, including changes in normal values with age.
- Approach to investigation and management of cytopenias (isolated anemia, thrombocytopenia, leukopenia, or mixed).
- Hemoglobinopathies: major complications and their management, important issues in health care maintenance in this population.
- Initial approach to the bleeding patient, initial approach to coagulation laboratory results.
- Approach to lymphadenopathy and hepatosplenomegaly.
- Initial management with a newly diagnosed hematological malignancy, with prevention and management of tumor lysis syndrome.
- Common forms of leukemia and lymphoma presenting in childhood.
- Usual presentations of the common pediatric solid tumors (brain tumors, Wilms tumor, neuroblastoma).
- Management of fever/neutropenia and the immunocompromised patient.
Specific Objectives:

1. **Approach to a Child with Bleeding**
   
   Objectives
   
   - To be familiar with some terminology used to describe the clinical manifestations of bleeding.
   - To come up with a differential diagnosis of the most common causes of bleeding in children.
   - To understand the basic investigations utilized in the work up of bleeding tendency in children.
   - To be aware of some therapeutic options that can be offered to children with bleeding.

2. **Approach to a Child with Pallor**
   
   Objectives
   
   - To be aware of the different causes of pallor
     - Non haematological: shock, resp failure, anaphylaxis, hypoglycaemia
     - Haematological: acute (blood loss, acute haemolysis) & chronic (chronic haemolysis, reduced erythropoiesis, bone marrow failure, chronic blood loss)
   - To be able to take a detailed history (birth history, medical history, bleeding history, drug history, dietary history & family history)
   - To be aware of G6PD as a cause of acute pallor in KSA and ask specifically about the urine colour
   - To be able to do a full general & systemic examination looking mainly for:
     - Viral signs, pallor, jaundice, general well-being and activity, signs of iron deficiency and malnutrition, bruising or mucosal bleeding, dysmorphic features or features suggestive of IBMFS, lymphadenopathy, HSM, abdominal mass, renal mass
• To understand the laboratory investigations for pallor including;
  o First line tests: CBC, red cell indices, retic count, blood film, b12, folate, ferritin, iron studies, TFT, renal and hepatic profile, DCT, LDH, haptoglobin
  o Second line tests: HPLC, G6PD assay, bone marrow biopsy, abd US, coeliac screen, etc
• To be aware that ferritin is an acute phase reactant
• To understand the importance of looking at peripheral blood film and requesting retic count
• To use MCV to classify anaemia (normocytic, microcytic & macrocytic) and know the differential diagnosis of each type.
• To be aware that the commonest cause of anaemia in children is IDA
• To have an idea about the treatment plan for different causes of pallor/anaemias.

3. Hemophilias

Objectives
• To be familiar with some terminology used to describe the clinical manifestations of bleeding.
• To understand the basic investigations utilized in the work up of bleeding tendency in children.
• To be aware of some therapeutic options that can be offered to children with hemophilia.

4. Hemoglobinopathies

Objectives
• To be aware of the common causes of haemoglobinopathies in KSA, mainly sickle cell disease, & thalassaemia syndromes
• To be able to differentiate and understand the difference between carrier/trait and disease
• To understand the basic genetics and inheritance pattern of these conditions
• To understand the clinical symptoms and signs of haemoglobinopathies, age of presentation & complications
• To understand the investigations and laboratory tests needed to confirm diagnosis and exclude other causes of haemolytic anaemia.
• To be aware of the management plan for these conditions including:
  o Close follow up in clinic
  o Importance of staring children with sickle cell disease on prophylactic penicillin
  o Growth monitoring and time to start regular transfusion in thalassaemia major
  o Parental education
  o Indications of blood transfusions in sickle cell disease
  o Complications of blood transfusion
  o Methods of assessing the iron overload
  o Iron chelation, different types of chelators, their choice and complications
  o Management of complications of sickle cell disease: painful crisis, sequestration crisis, aplastic crisis, acute chest syndrome, priapism, infection, stroke
  o Role of hydroxyurea in sickle cell disease
  o Importance of TCD screening in SSD
  o Indications of BMT for haemoglobinopathies
  o Importance of genetic counseling, offering the parents PGD & antenatal testing
5. **Acute Leukemias**

Objectives

- Nomenclature of leukemia (chronic /acute; lymphocytic/non-lymphocytic) according to WHO classification.
- Association of common non-random translocations with specific subgroups of common leukemias, according to the WHO classification.
- Understand the usual clinical presentations for leukemia and be able to identify some subtype-specific presentations.
- Initial management of patients with leukemia.
- Potential leukemia related complications and their management.
- Broad outlines of therapy for the different types of leukemia.
- Understand the concept of targeted therapy, with appropriate examples.

6. **Pediatric Solid Tumors**

Objectives

- Identify the common types of solid tumors in children, incidence, epidemiology, prognosis and impact
- Recognize the spectrum of the clinical presentation for the most common solid tumors in childhood
- Learn the various syndromes associated with solid tumors and the predisposition to cancer
- Demonstrate the appropriate clinical approach for a child with a suspected solid tumor
- Outline the proper differential diagnosis in the context of the clinical presentation
- Outline the appropriate investigations required to aid in the diagnosis
• Learn the pathognomic histological characteristics, common cytogenetic and immunophenotypic features of the most common solid tumors in children
• Learn the different treatment modalities to children with solid tumors
• Understand the most common early and long term complications of therapy and how to approach them

7. Bone Marrow Failure
• Familiarize the students with the different etiologies of bone marrow failure syndromes, and familiarize them with some of the known hereditary forms.
• Discuss the signs and symptoms that arise because of the bone marrow failure.
• Understand the general approach of patients with suspected bone marrow failure in terms of supportive care and available curative modalities

8. Oncological Emergencies
• To know common oncologic emergencies
• To know presentations of some serious signs and symptoms in oncology
• To know management of oncologic emergency
• To know early initiation of therapy

B. Job Descriptions:

Students rotating in the pediatric hematology/oncology service are expected to participate actively in the following:

I. Patient Care:
   a. The student is expected to:
      • Discuss problems of patient during daily ward rounds, formulate a problem-solving approach and set a plan of management.
• Trace results of various investigations and discuss them with the attending pediatric hematology/oncology team.
• Write updated (daily) progress notes
• Utilize appropriate consultation services
• Book patients for surgical procedures

b. The student will take care of 1-2 paediatric hematology/oncology patients in the inpatient service and attend clinics.

c. The student will work closely with the pediatric hematology/oncology team (clinical assistants, fellow or consultant). The team will provide supervision and support as deemed necessary.

II. Educational Activities:

There will be many educational opportunities for students to utilize during pediatric hematology/oncology rotation. The following activities are available:

• Interactions with pediatric hematology/oncology team during the daily ward rounds
• Case discussion/clinical approach by the attending pediatric hematology/oncology team
• New referrals to outpatient clinic
• The pediatric hematology/oncology weekly activities
• The student is encouraged to attend the following pediatric hematology/oncology educational activities:
  1. Journal Club
  2. Leukemia/Hematology Case Presentation
  3. Grand Rounds
  4. Mortality & Morbidity
  5. Hemostasis educational activities
6. Fellow's educational activities
7. Bone marrow Club
8. Solid tumour clinicopathology conference

III. Procedures:
The students are encouraged attend procedures done in the pediatric hematology/oncology service. (e.g. BMA, BM biopsy, diagnostic LPs, Intratechal therapy)

IV. Night calls:
Students may participate in the pediatric hematology/oncology department night call.
The following should be observed:

- The calls will be shared with the pediatric hematology/oncology assistant or fellow.
- All admissions (new + old) and consults should be discussed with the on-call team.

C. ASSESSMENT AND EVALUATION:

- Evaluation of students by the attending pediatric hematology/oncology consultant; the following will be evaluated:
  - Quality of patient care provided by the student
  - Punctuality, competency and reliability of the student
  - Enthusiasm of the student and his/her eagerness to learn.
  - The interaction and interpersonal relation with the pediatric hematology/oncology team & nurses.

- Continuous Assessment (Assessment during clerkship):
  Student presentations
  Task presentation and discussion
  Clerkship activities
The student is encouraged to discuss concerns he may encounter during his/her rotation either with the attending pediatric hematology/oncology consultant. All members are receptive for any constructive criticism and they will try their best to make the pediatric hematology/oncology rotation informative and enjoyable.