# STUDY GUIDE

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<th>Module Title</th>
<th>Hematology</th>
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## Introduction
This Hematology module hinges on the previous Blood module taught in semester 2. This module will focus on the abnormal aspects of Blood. It will deal with the principles and techniques of hematology laboratory investigations which are useful in the diagnosis of diseases and monitoring the progress of treatments. In the lab sessions, students will be exposed to some techniques involving handling and processing of blood and blood products for diagnostic purposes in routine clinical laboratories. The aims of this module are to give the students an overview of the disorders affecting blood, investigation techniques employed by the hematology laboratory and blood bank, the rationale behind these tests, and correlation with clinical conditions. Lecture and clinical postings are incorporated to address the clinical aspects of hematology supported by small group discussions with emphasis on principles of management of blood diseases. The skills and knowledge imparted in this module will help students recognize the signs and symptoms of patients with hematological diseases and will help them manage the patients.

## Target Students
semester V third year MBBS, 2018-19

## Duration
4 weeks

### Module Outcomes
At the end of the module, the students should be able to:
- Diagnose common blood related disorders based on history, clinical examination and investigation findings
- Correlate the clinical presentations with underlying pathophysiological processes
- Justify selection of investigations
- Interpret investigation and examination findings in order to come to a decision,
- Develop outlines of management for the common blood disorders,
- Demonstrate appropriate communication skills.

## Departments
- Clinical Faculty
- Anatomy
- Community Medicine
- Pathology
- Pharmacology
- Forensic Medicine

## DISCIPLINES

### COMMUNITY MEDICINE
- Describe how community and school policies protect the health, welfare, and safety of students.
- Discuss the role and inter-disciplinary methods of cancer control and prevention
- Describe the principles and concepts of an efficient immunization programme
- Discuss the immunity and its type and type of vaccine with cold chain
- Describe the important diseases related to blood
- Discuss the Epidemiology of cancer and its prevention
- Discuss the school health services

### FORENSIC MEDICINE
**Personal Identity**
- List the criteria for Sex determination
- List the different characteristics of Complete and partial identification

## LECTURES
Discuss the role of identification in living persons and dead bodies with examples
Explain the Parameters of identification and intersex states.
Describe the methods for determination of race
Summarize medico legal importance of age
Describe methods of age estimation in medico legal cases by General examination, Forensic odontology and Radiology
Describe Third party, Subjective and Objective methods of identification
Define Dactylography
Identify the various types of finger prints based on pictures provided
Describe the medicolegal importance of dactylography in crime scene investigation
Name Osteometric indices
State the formulae for Osteometric indices
Define Superimposition photography, Trace evidence
Describe Locard’s principle of exchange & its medico legal importance
Describe methods of identification of a dead, decomposed body, Mutilated & burnt bodies, and Skeletal & Fragmentary remains.
Discuss the medico legal importance of Hair, Scar, Tattoo marks and acquired and congenital deformities in identification.

**Thanatology**
- Define suspended animation
- List the examples of suspended animation
- List Howard’s criteria of death and methods of estimation of time since death
- Explain scientific concepts regarding death
- Discuss medico-legal aspects of brain death and sudden & unexpected deaths
- Differentiate among the concepts of causes, manner, modes and mechanisms of death
- Describe immediate signs of death with special stress on Somatic or clinical death
- Explain early changes after death such as changes in the eye, Algor Mortis (Cooling of the body).
- Discuss physico-chemical changes in various body tissues and organs under various environmental conditions, such as changes in muscular system after death
- Describe postmortem Lividity (Hypostasis or Suggilation) and its significance.
- Explain postmortem changes in the blood, CSF, Vitreous humor, Bone marrow
- Discuss Putrefaction; its mechanism, changes and gases of decomposition
- Estimate post mortem intervals based on knowledge about Forensic entomology
- Explain Adipocere formation and mummification
- Explain presumption of death and presumption of survivorship

**TUTORIALS**

By the end of the tutorial, students will be able to:

**Personal identity:**
- Determine age in at least 3 XRAYS of long bones
- Identify sex from the following bones:
  A. Skull
  B. Mandible
  C. Thorax
  D. Pelvis

**Thanatology**
- List immediate and early signs after death
- Describe the changes that occur in the eyes after death
- Differentiate Somatic from molecular death on a cadaver in Mortuary
- Differentiate Postmortem lividity from bruise on a cadaver in Mortuary
- Differentiate rigor mortis from cadaveric spasm on a cadaver in Mortuary
- Write death certificate according to WHO guidelines.

### PATHOLOGY
- Classify Anemia according to underlying mechanism
- Discuss pathogenesis and pathological changes in a patient with diminished erythropoiesis and hemolytic anemia including hereditary spherocytosis, Glucose 6PDehydrogenase deficiency, Sickle Cell Disease.
- Describe pathogenesis & pathological changes in patients suffering from Thalassemia, autoimmune hemolytic anemia
- Categorize and justify laboratory tests used in the diagnosis of anemia
- Interpret the blood report of patients suffering from microcytic & macrocytic anemia
- Describe bleeding disease, caused by thrombocytopenia, vessels wall defects and defective platelet functions.
- Discuss causes, signs & symptoms and investigations of patients of DIC, Thrombotic Thrombocytopenic Purpura, Hemolytic Uremic Syndrome and Idiopathic thrombocytopenic purpura.
- Name laboratory Screening Tests for bleeding and Coagulation disorders.
- Diagnose bleeding and coagulation disorder based n results of laboratory screening tests.
- Classify non-Hodgkin’s lymphoma & Hodgkin’s Lymphoma (according to WHO classification)
- State the incidence, prevalence, and risk factors of non-Hodgkin’s lymphoma.
- Differentiate among normal White cell, Leukemoid reaction & Malignant cell based on microscopic picture.
- Describe pathogenesis, clinical features and morphological features of Myelodysplastic Syndrome, Myeloproliferative Disorders
- Discuss the immunological basis of transplant rejection
- List the types, indications and complications for bone marrow transplantation
- Differentiate between normal individuals and patients with myelodysplasia based on peripheral blood and bone marrow findings.
- Describe blood transfusion and types of blood transfusion reactions.
- List indications and donor selections criteria for blood transfusion.

### PHARMACOLOGY
1. **Immunosuppressants & immunomodulants**
   - Classify Immunosuppressants & Immunomodulants
   - describe their pharmacokinetics and dynamics.
   - Describe their basic and clinical pharmacology
   - Distinguish their importance and the conditions in which they are used.
2. **Cancer Chemotherapy-I**
   - List the causes of cancer and discuss rationale of cancer chemotherapy.
   - Classify anticancer drugs according to functions and cell cycle specificity.
3. **Cancer Chemotherapy-II**
   - Discuss the mechanisms of action and major clinical uses, dose-limiting toxicities, and notable pharmacokinetic characteristics of anticancer drugs.
   - Explain the emergence of resistance against anticancer drugs.
4. Vasoactive Peptides

- Classify the vasoactive peptides
- Discuss the clinical importance and properties of different vasoactive peptides
- Describe the basic and clinical pharmacology of vasoactive peptides

5. Serotonin agonists & antagonists

- Explain the mechanism of action, therapeutic uses, adverse effects, and contraindications of serotonin agonists and antagonists
- State the role of serotonin, its agonist and antagonists in different clinical conditions.
- Discuss the clinical aspects of serotonin agonists and antagonists

MEDICINE

- Classify anemias, bleeding disorders and hematological malignancies
- Given written cases, diagnose the correct type of anemia & bleeding disorders
- Justify selection of investigations for making final diagnosis of anemia & bleeding disorders
- Develop a management plan for given cases of anemia
- Develop principles of management plan for given cases of bleeding disorder
- Discuss strategies for using anti-coagulation therapy and its complications
- Describe the signs and symptoms of DIC

PEDIATRICS

- Explain signs & symptoms, d/d and integrated management of a neonate/child suffering from hemoglobinopathies and hemolytic anemias
- Describe signs & symptoms, d/d, investigation of a child suffering from Rh incompatibility.
- Correlate pathophysiology with the clinical picture of DIC, Hemolytic uremic syndrome, Thrombotic thrombocytopenia

Practicals

- Pathology:
  1. Interpret CP report: Normal, microcytic Anemia
  2. Bone marrow examinations normal and abnormal
  3. Screening tests for bleeding and coagulation disorders interpretation
  4. Histological difference between normal white cell, leukemic reaction and malignant cell

- Pharmacology
  1. Immunomodulation
  2. Clinical approach to serotonin agonists and antagonists

- Skills lab:
  1. Injection techniques

Internal Evaluation:

- Internal evaluation carries 20% weightage in summative semester examination.
- It will consist of MCQs

End-of-Semester Exam

Final, end of semester exam will consist of One Correct MCQs, One Best MCQs and OSPE (observed + un observed stations).

SUGGESTED READINGS

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