

# Syllabus of Medical Parasitology

## **A. INTRODUCTION TO THE STUDY GUIDE :**

The Medical Parasitology course provides an overview of the human parasites and their diseases. Topics include the basic concept of protozoan parasite classes, Sarcodina, Flagellate ciliate, sporozoa. Special emphasis is placed on topics that related to humans health such as host-pathogen interactions and laboratory diagnostic methods. As the course of Medical Parasitology is concerned with diseases affecting man hence a knowledge of Biochemistry, Anatomy , Physiology , Pharmacology and Pathology is an essential prerequisite to the understanding of host-parasite relationships, clinical manifestation, pathogenesis and treatment.

The aim of the course is to develop basic knowledge and skill to identify the potozoa, the diseases caused by them and emphasize on the laboratory diagnosis tool for detection of different stages of them.

This study guide has been prepared as a guide for 3rd. Year Medical students in the Medical Parasitology course. It is not intended to be a complete manual of Parasitology but a guide assist the students as they direct themselves throughout the course. The purposes for this study guide :

1. To provide students with a clear description of the expectations, schedules and evaluation procedures for the course in Medical Parasitology.
2. It is the beginning of a data of information in Parasitology that students can take with themselves into their chosen discipline.
3. It is a communication device that the students can use as they talk with their teachers throughout their training period.

All three purposes listed above are intended to help the students become independent, lifelong learners. That is essential for them to become and continue to be effective and efficient physicians. It is hoped the students will find their work in this department interesting, and the department would advise them to use this opportunity to learn as much as possible during their time in this department as it might be the main opportunity for them to be in close contact with this specialty.

## **B. COURSE DESCRIPTION AND ORGANIZATION :**

The interest in parasitic and vector-borne diseases has recently increased tremendously not only in the tropical and sub-tropical countries but globally. The fast means of travel, the interdependence of countries, mass migration from rural to urban and endemic to non-endemic areas or vice versa have all increased the opportunities of mutual contact between people of different nationalities, races and

cultural groups. Some of the communicable diseases therefore have become more widespread particularly in the tropical and subtropical countries. Some of the above mentioned factors are compounded in the unique situation presented in the **Republic of Iraq** which is vast subtropical country situated at the west of Asia and in the center of three continent of the old World.

The course given to medical students will emphasize several aspects of parasites comprising :

1. Geographical distribution.
2. Diagnostic morphology of the causative organism both in its adult and developmental stages.
3. Life cycle, including :
  - a. the mode of infection ..
  - b. portal of entry and exit ..
  - c. the habitat ..
  - d.the cycle in man and in external environment and other vertebrate or invertebrate hosts ..
  - e. the factors (biological and environmental) that affect the cycle in its various phases ...
4. Pathogenesis of the disease and its relationship to the clinical manifestations, and Pathology.
5. Diagnosis with special stress on both the conventional and advanced techniques. The principles of the most commonly used immunodiagnostic techniques are also discussed.
6. Treatment with special stress on the most recent therapeutics.
7. Prevention and control with emphasis on the relevant aspects of the life cycle of the parasite.

**Throughout the course efforts will made to update the body of knowledge available on Parasitology:**

1. Treatment: the most recent medicaments will be mentioned with special emphasis on the drug of choice and other alternative drugs commonly in use.

2. Diagnosis: apart from the conventional methods of diagnosis the new up-to-date techniques are given including immuno-diagnosis. Besides, the students are informed about other methods of investigations e.g. computerized topography scan, ultrasonography, x- ray, radio immuno assays etc... whenever indicated.

**Special efforts will be made to stress the clinical aspects of parasitic diseases. In addition to the systematic teaching of Medical Parasitology there will be:**

a) Correlation of the biology of the parasite with the pathogenesis and clinical manifestations such as anaemia, fever, dysentery, diarrhoea, jaundice, lymphadenopathy, abdominal swellings, surgical problems, lung, liver, and cerebral affections etc. is explained.

b) Emphasis on the impact of life cycle and bionomics of the parasite on the epidemiology of the relevant disease.

c) Special attention will be paid to opportunistic parasites such as (e.g.) Toxoplasma, Pneumocystis, Nosema, free living amoebae, Strongioides and their relation to compromised immunity, immunosuppressive drugs, debilitating diseases, malignant diseases etc ...

**C. MAJOR COURSE OBJECTIVES.**

The course in human parasitology and medical entomology is designed to make students fully aware of the practical significance of the biology of human parasites and the phenomenon of parasitism.

By the end of the course the students should be able to:

1. Understanding of the importance, epidemiology, biology, life-cycle, morphology, diagnosis, symptomatology, management and prevention of the common helminths and protozoa parasitic in humans found in tropical and sub-tropical areas.

2. Show an appreciation of how knowledge of the various aspects of each parasite could help in understanding the rational of causation, propagation and maintenance of each parasitic infection in man and his environment.

3. Describe the pathogenesis and clinical manifestations of parasitic diseases.

4. Demonstrate the knowledge and procedures needed to carry out accurate diagnosis of common parasitic disease of man. 5. Arrive at rational conclusions, undertake effective therapeutic measures and also give sound advice on preventive and or control measures.

## 1st course

Date	Theory	Hr.	Lecturer	Practical	Hr.
1St Week	<p>Introduction: Students should:</p> <ol style="list-style-type: none"> <li>1. Understand the concept of parasitism.</li> <li>2. Know how the protozoa and helminthes are differentiated.</li> <li>3. Know the valid scientific names of all parasites of humans.</li> <li>4. Define a definitive host and intermediate host.</li> <li>5. Be aware of the criteria for classifying major arthropods of human importance.</li> <li>6. Be aware of sources of parasitic infections.</li> <li>7. Know the effect of the parasite on the host.</li> <li>8. Be aware of control and management of parasitic diseases.</li> <li>9. Be aware of different factors affecting epidemicity and endemicity of parasitic diseases.</li> </ol>	1	Dr. Ghada	Laboratory safety Dr. Azhar	2
2 <sup>nd</sup> Week	<p><i>Entamoeba histolytica</i> and other Amoebae inhabiting the alimentary canal, Students should be understand</p> <ol style="list-style-type: none"> <li>1. Name the protozoa causing diarrhoea and/or dysentery in humans.</li> <li>2. Know the underline mechanism of diarrhoea and/or dysentery in humans due to protozoal infection.</li> <li>.3. Know in detail the morphology, life cycle and epidemiology of <i>Entamoeba histolytica</i></li> <li>4. Discuss the modes of transmission of these parasites and how transmission can be prevented.</li> <li>5. Discuss the parasitological diagnosis of the intestinal protozoal infections.</li> <li>.6. Know what drugs are used to treat these protozoa.</li> </ol>	1	Dr. Anwar	Laboratory methods for Identification of parasite and sample collection Dr. Azhar	2
3 <sup>rd</sup> Week	<p><i>Giardia Lamblia</i>, and other important flagellate , Students should be understand</p> <ol style="list-style-type: none"> <li>1. Name the protozoa causing diarrhoea and/or Steatorrhea ( fatty stool) in humans.</li> <li>2. Know the underline mechanism of diarrhoea and/or dysentery in humans due to protozoal infection.</li> <li>.3. Know in detail the morphology, life cycle and epidemiology of <i>Giardia lamblia</i>,</li> <li>4. Discuss the modes of transmission of these parasites and how transmission can be prevented.</li> <li>5. Discuss the parasitological diagnosis of the intestinal protozoal infections.</li> <li>.6. Know what drugs are used to treat these protozoa.</li> </ol>	1	Dr. Hamss	<i>Giardia Lamblia</i> , and laboratory diagnosis Dr. Azhar	2
	Uringenital Flaellates, <i>Trichomonas</i> spp	1	Dr. Ghad	<i>Trichomona</i>	2

4 <sup>th</sup> Week	<p>Students should be understand</p> <ol style="list-style-type: none"> <li>1. Name the protozoa causing sexual disease in humans.</li> <li>2. Know the underline mechanism of sexual transmitted protozoan in humans due to protozoal infection.</li> <li>3. Know in detail the morphology, life cycle and epidemiology of <i>Trichomonas</i> spp transmission of this parasites and how transmission can be prevented.</li> <li>5. Discuss the parasitological diagnosis of the vaginal swab and discharge</li> <li>6. Know what drugs are used to treat these protozoa.</li> </ol>		a	s spp and laboratory diagnosis Dr. Azhar	
5 <sup>th</sup> Week	<p>Blood and tissue Flaellates <i>Trypanosoma gambiense, Trypanosoma rhodeseinse</i>, Students should be understand</p> <ol style="list-style-type: none"> <li>1. Name the diffrent species of human Blood and tissue Flaellates <i>Trypanosoma gambiense, Trypanosoma rhodeseinse</i> Old World.</li> <li>2. Describe the life cycle of <i>Trypanosoma</i> species.</li> <li>3. Understand the basic histopathology of <i>Trypanosoma</i> species</li> <li>4. Discuss the clinical differentiation of the different species of human <i>Trypanosoma</i> species.</li> <li>5. Describe the general morphology and distribution of the <i>tsetse</i> fly and kissing bug species</li> <li>6. Discuss the worldwide epidemiology and situation of <i>Trypanosoma</i> species</li> <li>7. Know the methods of <i>Trypanosoma</i> species diagnosis.</li> </ol>	1	Dr. Anwar	Technique of collection preparation and examination of samples ( blood samples) Dr. Azhar	2
6 <sup>th</sup> Week	<p>Blood and tissue Flaellates <i>Trypanosoma cruzi</i> Students should be understand</p> <ol style="list-style-type: none"> <li>1. Name the diffrent species of human Blood and tissue Flaellates <i>Trypanosoma gambiense, Trypanosoma rhodeseinse</i> New World.</li> <li>2. Describe the life cycle of <i>Trypanosoma</i> species.</li> <li>3. Understand the basic histopathology of <i>Trypanosoma</i> species</li> <li>4. Discuss the clinical differentiation of the different species of human <i>Trypanosoma</i> species.</li> <li>5. Describe the general morphology and distribution of the <i>tsetse</i> fly and kissing bug species</li> <li>6. Discuss the worldwide epidemiology and situation of <i>Trypanosoma</i> species</li> <li>7. Know the methods of <i>Trypanosoma</i> species diagnosis.</li> </ol>		Dr. Hamss	Methods useful for diagnosis of Infections: microbiology, PCR, serology. Dr. Azhar	2
7 <sup>th</sup> Week	Mid Term Examination		All the department lecturer	Mid Term Examination	
8 <sup>th</sup> Week	<p>Blood and tissue Flaellates <i>Leishmania Donovanii</i>, student should know</p> <ol style="list-style-type: none"> <li>1. Name the different species of human leishmania parasites (cutaneous, mucocutaneous and visceral Leishmaniasis) both in the Old World and the New Wrld.</li> <li>2. Describe the life cycle of <i>leishmania</i> species.</li> <li>3. Understand the basic histopathology of <i>leishmania</i> parasite.</li> <li>4. Discuss the clinical differentiation of the different species of</li> </ol>		Dr. Anwar	Review	

	<p>human <i>leishmania</i> parasites.</p> <p>5. Describe the general morphology and distribution of the sand fly vectors of <i>leishmania</i> species</p> <p>6. Discuss the worldwide epidemiology and situation of Leishmaniasis in Republic of Iraqi peoples .</p> <p>∇. Know the methods of leishmania diagnosis.</p>				
9 <sup>th</sup>	<p>Blood and tissue Flaellats <i>Leishmania tropica</i>, <i>Leishmania braziliensis</i></p> <p>student should know</p> <p>1.Name the different species of human leishmania parasites (cutaneous, mucocutaneous and visceral Leishmaniasis) both in the Old World and the New Wrld.</p> <p>2. Describe the life cycle of <i>leishmania</i> species.</p> <p>3. Understand the basic histopathology of <i>leishmania</i> parasite.</p> <p>4. Discuss the clinical differentiation of the different species of human <i>leishmania</i> parasites.</p> <p>5. Describe the general morphology and distribution of the sand fly vectors of <i>leishmania</i> species</p> <p>6. Discuss the worldwide epidemiology and situation of Leishmaniasis in Republic of Iraqi peoples .</p> <p>∇. Know the methods of <i>leishmania</i> diagnosis.</p>		Dr. Hamss	Method of diagnosis skin parasite Dr. Azhar	2
10 <sup>th</sup> Week	<p><i>Cilata</i></p> <p><i>Balantidim coli</i></p> <p>Students should be understand</p> <p>1. Name the protozoa causing diarrhoea and/or dysentery in humans.</p> <p>2. Know the underline mechanism of diarrhoea and/or dysentery in humans due to protozoal infection.</p> <p>.3. Know in detail the morphology, life cycle and epidemiology of <i>Balantidim coli</i></p> <p>4. Discuss the modes of transmission of these parasites and how transmission can be prevented.</p> <p>5. Discuss the parasitological diagnosis of the intestinal protozoal infections.</p> <p>.6. Know what drugs are used to treat these protozoa.</p>		Dr. Ghada	DNA extraction and PCR technique Dr. Azhar	2
11 <sup>th</sup> Week	<p>Sporosoa, <i>Plasmodium spp</i></p> <p>Students should be able to :</p> <p>1. Name the four species of human malarial parasites.</p> <p>2. Describe the life cycle of the four species of human malarial parasites, and how to relate the life-cycle to Pathogenesis, clinical manifestations and complications.</p> <p>3. Understand the basic pathplogical changes of the malarial parasite.</p> <p>4. Discuss the clinical differentiation of the four species of human malarial parasites.</p> <p>5. Distinguish between the four species of human malarial parasites seen in thin blood smears, describe the findings and recognise the three main stages of the parasite (trophozoite,</p>		Dr. Anwar	<i>Plasmodium spp</i> and method of diagnosis blood parasite Dr. Azhar	2

	<p>schizont and gametocyte) seen in the peripheral blood. 6. Know the methods of malaria diagnosis.</p> <p>7. Discuss the worldwide epidemiology and situation of malaria in Saudi Arabia.</p> <p>8. Describe the general morphology and distribution of the mosquito vectors of malaria and different methods used to control mosquito.</p>				
12 <sup>th</sup> Week	<p>Sporosoa, <i>Toxoplasma gondii</i></p> <p>Students should be understand</p> <p>1. Describe the morphology, life cycle, diagnosis and epidemiology of <i>Toxoplasma gondii</i>.</p> <p>.2. Be aware of the clinical significance of infection with <i>T. Gondii</i></p> <p>3. Discuss modes of transmission of <i>T. Gondii</i></p> <p>4. how transmission can be prevented, and options for treatment..</p> <p><i>i</i></p>		Dr. Hamss	method of diagnosis blood parasite Dr. Azhar	2
13 <sup>th</sup> week 28/12	<p>Sporosoa, <i>Cryptosporidium</i>,</p> <p>Students should be understand</p> <p>1. Name the protozoa causing diarrhoea and/or dysentery in humans.</p> <p>2. Know the underline mechanism of diarrhoea and/or dysentery in humans due to protozoal infection.</p> <p>.3. Know in detail the morphology, life cycle and epidemiology of <i>Cryptosporidium sp.</i></p> <p>4. Discuss the modes of transmission of these parasites and how transmission can be prevented.</p> <p>5. Discuss the parasitological diagnosis of the intestinal protozoal infections.</p> <p>.6. Know what drugs are used to treat these protozoa.</p>		Dr. Ghada	Review	2
14 <sup>th</sup> Week	<p>Other Protozoa of Medical Importance</p> <p>Students should be able to : Know the clinical significance of <i>Pneumocystis carini</i> and <i>Babesia sp.</i></p>		Dr. Anwar	ELISA and IFA technique Dr. Azhar	2
15 <sup>th</sup> week	<p>General parasite immunity,</p> <p>Students should be know to : 1. One important point in parasite immunity is the ability of the immune system 2. recognize and respond to parasitic infections.</p> <p>3. Parasites are organisms that rely on the host for survival and can cause various diseases.</p> <p>4. The immune response against parasites is crucial in preventing and controlling their infection.</p>		Dr. Hamss	ELISA and IFA technique Dr. Azhar	2