Infection I Module Concept map 2016/17 Batch

Year 2 Semester 2.

Module Coordinator: Head Microbiology/ Head Parasitology or an appointed staff member from Department of Microbiology or Parasitology.

Resource pool

Department of Microbiology
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Department of Parasitology
Prof D. Iddawella (Head/Parasitology)
Dr R. Morel
Prof S. Wickramasinghe
Dr D. Atapattu

Department of Biochemistry
Prof. KalanaMaduwage

No. of credits 4

Component	Lectures	SGDs	Practical's	Seminar	Formative assessments /Assignment
General	7	1	4	2	
Bacteriology	12	2	1.5		1
Virology	10	1	1.5		2
Mycology	2				
Combined Microbiology					2
Parasitology	15	3	5.5		
Total	46	12			
Credit equivalents					5

Hours of credit equivalence = 61 lectureh
Total Lectures } 58h
SGD }
Seminars 2 h
Practical's Per student 12.5 h
Total time tabled hours 131
Total credit hours 67.25

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Topic	Time	Objectives	Dept	Resp/person	Teaching/ Learning activity
1. Overview of microbiology in relation to human health	1 h	1. Explain the interactions of microorganisms in relation to human beings 2. State why medical undergraduates need to know about micro organisms 3. Describe what medical microbiologists and parasitologists do	Micro	Module coordinator	Lecture
2. Proving causation of infection, causality - Koch's postulates and its limitations **3. Microbial classification and visualization**	1h	1. Discuss how causation of infections can be proved by being able to state and explain Koch's postulates and it's limitations 2. Describe the basis of microbial classification 3. Describe the basic structure of bacteria, fungi and viruses 4. State the methods by which microorganisms can be visualized and identified Outline how these methods could be used to diagnose infective diseases	Micro	Module coordinator	Lecture
2. Introduction to Medical Parasitology and classification of parasites	1 h	1. List the characteristics of different groups of protozoa, helminths (nematodes, cestodes, trematodes) and arthropods	Parasit	Module coordinator	Lecture
6. Microscopy	1.5 h x 4 groups	1. Identify the parts of a compound light microscope 2. Perform light microscopy following a standard operating procedure and properly use the compound light microscope 3. Name the different types of microscopes available and their specific uses	Micro and Parasit	Module coordinator	Practical
7. Microbial growth, dissemination and survival within and outside the human host **8. Host-parasite relationship**	1 h	1. Describe the dynamics of growth in different types of micro organisms 2. List the different ways in which microorganisms survive for long periods	Micro	Module coordinator	Lecture

9. The process by which organisms cause disease to host tissue		within and outside the human host 3. Explain the terms Commensal/ normal flora, Colonizer/ transient flora and the concept of the 'microbiome' 4. Describe the relationships of microorganisms to the human host (contamination, colonization and infection) 5. List the currently known modes of transmission – microbial entry 6. Explain the terms exogenous and endogenous infections 7. Explain the term pathogenesis, 8. Describe steps that occur in establishment of microbial infections – e.gattachment, colonization, invasion, tissue damage 9. Explain how common clinical manifestations of infections reflect these mechanisms of damage in various organs			
10. Parasites & People: Inter-relationships among parasites, hosts and vectors	1h	1. Define the following terms; parasite, host, endoparasite, ectoparasite, pathogen, commensal, obligatory parasite, facultative parasite, definitive host, intermediate host, reservoir host, and vectors (mechanical and biological) 2. Describe the growth, survival and spread of protozoan and helminth parasites within and outside the human host	Parasit	Module coordinator	Lecture
11. Methods of preventing infections to include sterilization and disinfection	1 h	1. Define the terms sterilization, disinfection, anti-septic and disinfectant. 2. Explain 'Standard precautions' in relation to 'Infection Control'. 3. Discuss the principles of infection prevention.	Micro	Module coordinator	Lecture
	1 h x 8 groups	4. Perform hand hygiene, with knowledge of underlying principles, by different methods	Micro	Module coordinator	Practical

Topics 1 –11	1 h	Objectives of topics 1 - 10	Micro and Parasit	Module coordinator	SGD
Topics 1 – 11	3h + 2 facilitator meetings	Objectives of topics 1 - 10	Micro and Parasit	Module coordinator	Seminar and 2 meetings
Introducing medically important Bacteria					
12. Introduction to bacteria including concepts in diagnosing bacterial infections	1h + 1.5 hr x 4 groups	1. List the methods available to diagnose bacterial infections a) Visualization b) Culture and Antibiotic susceptibility testing (ABST) c) Antigen detection d) Antibody detection e) Detection of nucleic acid 2. Explain briefly the advantages and disadvantages of the given methods 3. Discuss the how the methods mentioned in objective 1 can be used to diagnose common bacterial infections	Micro	Module coordinator	Lecture + Practical
13. Staphylococci	1 h	1. Describe the medically important bacteria and their major morphological and biological characteristics that determine visualization/ identification in the laboratory 2. Describe the habitat, main mode(s) of transmission, morphology and growth characteristics in relation to identification,	Micro	Module coordinator	Lecture
14. Streptococci and Enterococci –	1h		Micro	Module coordinator	Lecture
15. Gram negative cocci to include *Neisseria* and *Moraxella*	1 h		Micro	Module coordinator	Lecture
16. Gram positive bacilli to include	1 h		Micro	Module	Lecture

*Corynebacteria, Bacillus, Norcardia*and *Listeria*		key virulence factors, pathogenicity and basis of clinical disease,		coordinator	
17. Mycobacteria	1 h	3. Discuss the principles of laboratory diagnosis and prevention of bacterial infections	Micro	Module coordinator	Lecture
18. Anaerobes including *Clostridia, Actinomycetes* and*Prevotella*	1 h	4. Describe the principles of treatment of bacterial infections	Micro	Module coordinator	Lecture
19. Gram negative bacilli to include enterobacteriacae , pseudomonads and other NLF of clinical importance including Acinetobacter	1 h		Micro	Module coordinator	Lecture
20. Gram negative cocco bacilli to include *Haemohpilus, Bordetella, Legionella* and *Pasteurella*	1 h		Micro	Module coordinator	Lecture
21. Vibrio, Campylobacter and *Helicobacter*	1 h		Micro	Module coordinator	Lecture
22. Spirochaetes	1 h		Micro	Module coordinator	Lecture
23. *Chlamydia*, Rickettsioses and *Mycoplasma*	1 h		Micro	Module coordinator	Lecture
24. Correct use of microscope, observation of smears and documentation of findings	1 h x 4 groups	1. Perform light microscopy following a standard operating procedure 2. To identify Gram positive and negative bacteria	Micro	Module coordinator	Practical
Introducing medically important viruses					
25. Introduction to virology	1 h	1. Describe the general properties and classification of viruses	Micro	Module coordinator	Lecture
26. Viruses causing Hepatitis	1 h	2. Explain the process of viral replication 3. Describe mechanisms by which viruses cause disease in humans	Micro	Module coordinator	Lecture
27. Pox/ adeno/ parvo/ papova viruses	1 h	4. State the mainhost defense mechanisms against viruses	Micro	Module coordinator	Lecture
28. Herpes viruses	1 h	5. Explain the main clinical features of viral infections/disease in humans	Micro	Module coordinator	Lecture
29. Respiratory viruses	1 h	6. Evaluate the principles of laboratory diagnosis and prevention of viral infections	Micro	Module coordinator	Lecture
30. Entero viruses and Viruses causing gastroenteritis	1 h	7. Describe the principles of treatment of viral infections	Micro	Module coordinator	Lecture /SGD (article)
31. Arbo viruses	1 h		Micro	Module	Lecture

				coordinator	
32. Retro viruses/ oncogenic viruses/ prions	1 h		Micro	Module coordinator	Lecture
33. Viruses of zoonotic importance to include rabies	1 h		Micro	Module coordinator	Lecture
34. Diagnostics in viral infections	1 h 1.5 h x 4 groups	1. Discuss the different methods used in the laboratory diagnosis of common viral infections a) Visualization b) Antigen detection c) Nucleic acid detection c) Culture d) Viral specific antibody detection e) Molecular detection methods to include molecular diagnosis of infectious diseases- – to be included as Molecular diagnosis practical	Micro	Module coordinator	Lecture Practical
35. Topics 25 to 37 MCQs	3 h	Objectives of topics 25 - 37	Micro	Module coordinator	SGD
Introducing medically important fungi					
36. Superficial mycoses	1h	1. Describe fungi associated with human infections including laboratory diagnosis and principals of treatment	Micro	Module coordinator	Lecture
37. Sub cutaneous and deep mycoses	1h		Micro	Module coordinator	Lecture
38. Topics 1 - 37 – MCQs	3h	Objectives of topics 1– 40	Micro	Module cordinator	SGD
39. Topics 1 – 38	2 h	Objectives of topics 1 – 40	Micro + Parasit	Module coordinator	Assignment
40. Malaria	1h	1. Name the human malarial parasites 2. Describe the life cycle of *Plasmodium*species 3. Discuss the diagnostic importance of erythrocytic stages in peripheral circulation.	Parasit	Module coordinator	Lecture

		4. Evaluate the methods of laboratory diagnosis 5. Discuss the preventive measures based on the life cycle.			
41. Invasive intestinal protozoa - (amoebae and ciliate)	1h	1. Name the common intestinal amoebae andthe ciliate that infect humans 2. Outline the life cycle of *Entamoeba histolytica* indicating the infective, pathogenic and diagnostic stages. 3. Describe the pathogenesis and clinical features of amoebiasis 4. Identify points inthelife cycle where preventive measures are applicable. 5. Discuss the methods oflaboratory diagnosis of the infections	Parasit	Module coordinator	Lecture
42. Other intestinal andurogenital protozoa– *Giardiaduodenalis,Cryptosporidium*species and *Trichomonas vaginalis*	1h	1. Name the intestinal and tissue flagellates that infect humans and state their habitats 2. Name the intestinal coccidia that infect humans 3. Outline the life cycle of *Giardia duodenalis, Trichomonas vaginalis* and*Cryptosporidum*speciesindicating the infective, pathogenic and diagnostic stages. 4. Describe the pathogenesis and clinical features. 5. Evaluate the methods of laboratory diagnosis.ns 6. Discuss the preventive measures based on the life cycle	Parasit	Module coordinator	Lecture
43. Haemoflagellates	1 h	1. Name the parasite(s) causing human leishmaniasis in Sri Lanka 2. Name the vector of human leishmaniasis in Sri Lanka 3. Discuss the prevention and control of leishmaniasis in Sri Lanka. 4. Describe the pathogenesis and clinical manifestations of leishmaniasis 5. Evaluate the methods of laboratory	Parasit	Module coordinator	Lecture

		diagnosis of leishmaniasis 6. Name the parasites and vectors causing trypanosomiasis 7. Outline the geographical distribution, clinical features and laboratory diagnosis of African and American trypanosomiasis			
44. Tissue coccidian (*Toxoplasma gondii and Sarcocystis species)*	1h	1. Name the tissue coccidia that infect humans 2.Outline the life cycle of *Toxoplasma gondii* indicating the infective, pathogenic and diagnostic stages. 3.Discuss the prevention and transmission of toxoplasmosis 4. Evaluate the methods of laboratory diagnosis of toxoplasmosis (congenital and acquired)	Parasit	Module coordinator	Lecture
45. Helminths-Intestinal Nematodes *Ascaris lumbricoides, Necator americanus, Trichuris trichiura, Enterobius vermicularis, Strongyloides stercoralis*	2 h	1. Namethe common intestinal nematodes in humans 2. Describe the major morphological characteristics of parasitic nematodes 3. Outline the life cycle of intestinal helminths indicating the infective, pathogenic and diagnostic stages. 4. Describe the pathogenesis and clinical features. 5. Evaluate the methods of laboratory diagnosis ofintestinal nematode infections 6. Discuss the prevention and control of intestinal nematode infections.	Parasit	Module coordinator	Lecture
46. Tissue nematodes -filarial worms	1 h	1. Name the major tissue nematodes of humans indicating those found in Sri Lanka. 2. State their location in the human body. 3. Name the vectors of tissue nematodes found in Sri Lanka 4. Discuss the importance of periodicity of microfilaria in relation to transmission and diagnosis.	Parasit		

		5. Outline the life cycle of *Wuchereriabancrofti*and*Brugiamalayi*indicating the infective, pathogenic and diagnostic stages. 6. Evaluate the methods of laboratory diagnosis of filariasis 7. Discuss the prevention and control filariasis			
47. Cestodes *Taenia solium,Taenia.saginata, Hymenolepsis diminuta, Hymenolepsis nana, Echinococcus granulosus*	1 h	1. State the major morphological characteristics of the parasitic cestodes 2. Outline the life cycles of indicating the infective, pathogenic and diagnostic stages. 3. State the dangers of larval cestode infections – Hydatidosis and Cysticercosis 4. Evaluate the methods of laboratory diagnosis of cestode infections. 5. Discuss the prevention and control.	Parasit	Module coordinator	Lecture
48. Arthropods of medical importance 1 - mosquitoes	1 h	1. Name the major mosquito borne diseases in Sri Lanka and worldwide indicating the disease(s) that they transmit 2. Outline the life cycle of a mosquito 3. Describe the breeding habits of medically important mosquito species in Sri Lanka indicating strategies used for prevention and control.	Parasit	Module coordinator	Lecture
49. Parasites of global importance	1h	1. Name the parasitic diseases of global importance 2. Name theparasites causing schistosomiasis and food borne trematode infections 3. Outline the mode of transmission of schistosomes and important food-borne trematodes 4. Describe the clinical features of schistosomiasis and important food-borne trematode infections. 5. State the methods of laboratory diagnosis of these infections	Parasit	Module coordinator	Lecture

		6. Outline the prevention and control strategies of these infections			
49. Arthropods of medical importance - 2 a.) Flies b)Fleas, lice and bugs c)Ticks and mites	1 h	1.Define the terms mechanical and biological vectors (recall) 2. Flies • Explain the importance of housefly as a mechanical vector of disease • Name the other groups of flies that are medically important • Describe myiasis 3. Ticks/fleas/bugs • Differentiate ticks, fleas and bugs from eachother • Outline their medical importance 4. Mites • Name the major morphological characteristics of *Sarcoptes scabiei* mite • Outline the life cycle 5. Lice • Differentiate the three types of lice (head , body and pubic) • Name the drugs used for treatment 6. Describe the control methods of vectors and ectoparasites.	Parasit Parasit	Module coordinator Module coordinator	Lecture Lecture
51. Poisonous snakes and envenomation	2 h	1. Name the important snakes which belongs to the families- Elapidae, Viperidae and Colubridae 2. Name the poisonous snakes in Sri Lanka 3. Name the common (important) non-poisonous snakes in Sri Lanka 4. Name the main phenotypic characteristics of these (2 and 3) if shown a specimen/ an image (see demonstration on snakes) 5. State the major effects of snake venom in different groups of poisonous snakes in Sri Lanka 6. State the principles underline the	Parasit	Module coordinator	Lecture

		treatment and management of snake bites 7. State the precautions that should be taken to prevent snake bite			
52. Demonstration on venomous snakes	1 hour x 4 groups	1. Identify medically important snakes of Sri Lanka if shown specimens or image	Parasit	Module coordinator	Demonstration
53. Demonstration on intestinal protozoa and helminths	1 h x 4 groups	1. Identify pathogenic and non pathogenic intestinal amoeba, intestinal and urogenital flagellates on the stained and wet smears 2. Identify the specimens of adults and eggs of intestinal nematodes	Parasit	Module coordinator	Demonstration
54. Demonstration on tissue protozoa, arthropods	1 h x 4 groups	1. Identify medically important mosquitoes , 2. Differentiate flies fleas and mites from each other 3. Identify *Leishmania* amastigotes on stained slide 4. Identify the trypomastigotes of trypanosomes on stained slide 5. Identify malarial parasites on stained thin and thick smear 6. Identify adult taenid segments and cestode larval stages 7. Identify schistosome adult and eggs	Parasit	Module coordinator	Demonstration
55. Practical a) Faecal smear preparation and examination for intestinal protozoan and helminthes	1 h x 4 groups	Practical skills to be acquired 1. Be able to properly use the compound light microscope 2. Discuss the principles regarding collection, storage and delivery/transport of faecal and blood specimens to a laboratory for diagnosis of parasitic infections 3. Be able to prepare and examine wet smear of stools in saline and iodine to identify intestinal protozoan and helminth parasites	Parasit	Module coordinator	Practical
56. Topics 40 - 55	3 h	1. Objectives of topics 40 – 55	Parasit	Module coordinator	SGD