



PHASE II

MULTYSYSTEM INFECTIONS

**FACULTY OF MEDICAL SCIENCES
UNIVERSITY OF SRI JAYAWARDENEPURA**

Introduction

Multisystem Infections is a phase 2 module of 3 weeks duration.

During this module you will be taught about infections which commonly affect more than one system. These include malaria, tuberculosis, dengue, leptospirosis, toxoplasmosis, visceral larva migrans and trypanosomiasis. These diseases are an important cause of significant mortality and morbidity in Sri Lanka. The commonly used and important antibiotics, antivirals and antifungals are also dealt with during this module. Sepsis, hospital acquired infections and fever are also included.

These areas will be taught to you in lectures and practicals and the knowledge gained will be reinforced at tutorials and small group discussions. There will be fixed learning modules on areas which are not covered in lectures.

To facilitate learning a list of recommended reading material is included in this document. You are also advised to read around the topics in standard medical journals.

General Objectives

1. At the end of the Module in Multisystem Infections the students should know the following aspects of Malaria, Tuberculosis, Dengue, Leptospirosis, Toxoplasmosis, Visceral Larva Migrans, Trypanosomiasis and Visceral Leishmaniasis:
 - Aetiopathogenesis and modes of transmission
 - Pathogenesis in relation to clinical features
 - Plan out investigations to arrive at a diagnosis
 - Management of a patient
 - Impact on social, occupational & environmental factors
 - Epidemiology, control and prevention
2. The pharmacology of the chemotherapeutic agents especially available in Sri Lanka and the indications for their use.
3. Aetiopathogenesis, clinical features, laboratory diagnosis and management of fever and septicemia.
4. Aetiopathogenesis, clinical features, laboratory diagnosis, management and prevention of Hospital Acquired Infections.

Committee Members

Development Stage

Chairperson	Dr .C. Wanigatunge
Convener	Dr. Enoka Gunawardene
Member	Dr. Neluka Fernando
Member	Prof Sriyani Ekanayake
Member	Dr. K. Wanigasuriya

Implementation Stage

Chairperson	Dr .C. Wanigatunge
Convener	Dr. P. Jayawardene
Member	Dr. Neluka Fernando
Member	Prof. Sriyani Ekanayake
Member	Dr. K. Wanigasuriya

Contents

1. Tuberculosis
2. Malaria
3. Dengue
4. Sepsis & fever
5. Leptospirosis
6. Toxoplasmosis
7. Visceral Larva Migrans
8. Visceral Leishmaniasis
9. Antibiotics, Antivirals & Antifungals
10. Hospital Acquired Infections & Infection Control
12. Trypanosomiasis

Tuberculosis

Intermediate objectives	Detailed content areas	Activity	Time	Department
<ul style="list-style-type: none"> Discuss aetiopathogenesis, microbiological basis of investigations in Tuberculosis 	<ul style="list-style-type: none"> A) Etiology, pathogenesis investigations and diagnosis of Tuberculosis 	<ul style="list-style-type: none"> 1 Lecture 1 Practical 	<ul style="list-style-type: none"> 45 mts 45 mts 	Microbiology
<ul style="list-style-type: none"> Describe the pathology of Tuberculosis List the different types of TB Describe the differences between these types Describe the pathological features (macro and microscopy) and complications of primary and 	<ul style="list-style-type: none"> A) Pathology of different types of TB A) Differences between these types A) Pathological features (macroscopy and microscopy) A) Koch's phenomenon. 	<ul style="list-style-type: none"> 1 Lecture 1 Practical 1 Tutorial 	<ul style="list-style-type: none"> 45 mts 45 mts 45 mts 	Pathology

secondary TB.				
<ul style="list-style-type: none"> Describe the clinical manifestations of Tuberculosis 	<ul style="list-style-type: none"> A) Clinical features of pulmonary and extra pulmonary tuberculosis. 	1 Lecture	45 mts	Medicine
<ul style="list-style-type: none"> Discuss pharmacology of antituberculous drugs. 	<ul style="list-style-type: none"> A) Pharmacokinetics, adverse effects, contraindications, important drug interactions of anti tuberculous drugs. A) Treatment regimes for Tuberculosis. B) MDR TB 	2 Lectures 1 Tutorial	90 mts 45 mts	Pharmacology
<ul style="list-style-type: none"> Discuss the prevention and epidemiology of TB 	<ul style="list-style-type: none"> A) Prevention And Epidemiology 	1 Lecture	45 mts	Community Medicine

Visceral Larva Migrans

Intermediate objectives	Contents	Activity	Duration	Department
<ul style="list-style-type: none">• Name the nematodes that cause Visceral Larva Migrans(VLM)	<ul style="list-style-type: none">• C)Nematodes that cause VLM	FLM		Parasitology
<ul style="list-style-type: none">• Describe the pathological lesions and the clinical features	<ul style="list-style-type: none">• C)Pathogenesis and clinical features			
<ul style="list-style-type: none">• Outline the laboratory diagnostic methods, prevention, control & treatment in relation to the parasite	<ul style="list-style-type: none">• C)Laboratory diagnostic methods, prevention, control & treatment			

Hospital Acquired Infections(HAI) & Infection Control

Intermediate objectives	Contents	Activity	Duration	Department
<ul style="list-style-type: none"> Define HAI 	<ul style="list-style-type: none"> A)Definition 	Lecture Tutorial	45 mts 45 mts	Microbiology
<ul style="list-style-type: none"> Describe the pathogenesis of HAI (Hospital acquired respiratory infections, surgical wound infections, infections associated with IV devices & blood and blood products) 	<ul style="list-style-type: none"> A)Pathogenesis of HAI 			
<ul style="list-style-type: none"> Discuss the collection and transport of relevant specimens & interpretation of lab investigations in Hospital acquired respiratory infections, surgical wound infections, infections associated with IV devices & blood and blood products 	<ul style="list-style-type: none"> A)Collection and transport of relevant specimens & interpretation of lab investigations in HAI 			

<ul style="list-style-type: none"> • Discuss the prevention and control of above infections 	<ul style="list-style-type: none"> • A)Prevention and control 			
<ul style="list-style-type: none"> • Describe infection control in the hospital 	<ul style="list-style-type: none"> • B)Infection control organization in a hospital • B)Limiting transmission of organisms between patients • B)MRSA control • A)Universal precautions • C)Infection control in special situations 			
<ul style="list-style-type: none"> • Describe the investigations of an out break & the basic strategies for infection control in hospitals 	<ul style="list-style-type: none"> • B)Investigations of an out break & the basic strategies for infection control in hospitals 			

Malaria

Intermediate objectives	Contents	Activity	Duration	Department
<ul style="list-style-type: none"> Name the species of human malaria parasites found in Sri Lanka 	<ul style="list-style-type: none"> A)The species of human malaria parasites found in Sri Lanka 	3 Lectures 2 Practicals 2 Tutorials	3x 45 mts 2x 45 mts 2x 45 mts	Parasitology
<ul style="list-style-type: none"> Outline the life cycle of the malaria parasites and modes of transmission 	<ul style="list-style-type: none"> A)Life cycle of the malaria parasites in relation to clinical features, diagnosis, treatment and modes of transmission 			
<ul style="list-style-type: none"> Name the vector in Sri Lanka 	<ul style="list-style-type: none"> A)Vector in Sri Lanka 			
<ul style="list-style-type: none"> Describe the pathology of malaria in relation to the erythrocytic cycle 	<ul style="list-style-type: none"> A)Pathology of malaria in relation to the erythrocytic cycle 			
<ul style="list-style-type: none"> Describe the seasonal incidence of the disease 	<ul style="list-style-type: none"> B)The seasonal incidence of the disease 			

<ul style="list-style-type: none"> Describe the laboratory diagnostic methods used for the diagnosis of malaria 	<ul style="list-style-type: none"> A)The laboratory diagnostic methods used for the diagnosis of malaria C)Identify life cycle stages of the parasite from thick and thin blood films 			Parasitology
<ul style="list-style-type: none"> Describe the types of drug resistance 	<ul style="list-style-type: none"> B)Types of drug resistance 			
<ul style="list-style-type: none"> Describe the stages of the life cycle where drug intervention is possible and the principles of treatment 	<ul style="list-style-type: none"> A)The stages of the life cycle where drug intervention is possible and the principles of treatment 	1 Lecture 1 Tutorial	45 mts 45 mts	Pharmacology
<ul style="list-style-type: none"> Name the individual antimalarial drugs 	<ul style="list-style-type: none"> Individual antimalarial drugs : A)Drugs commonly used B) New / restricted use drugs 			

<ul style="list-style-type: none"> Describe the pharmacological basis, indications, pharmacokinetics, method of administration, adverse effects, precautions, contraindications of the commonly used antimalarials 	<ul style="list-style-type: none"> A) Pharmacological basis, indications, pharmacokinetics, method of administration, adverse effects, precautions, contraindications of the commonly used antimalarials 			
<ul style="list-style-type: none"> Describe the treatment regimens used in the management of malaria in Sri Lanka 	<ul style="list-style-type: none"> A) Treatment regimens of <i>P. vivax</i>, <i>P. falciparum</i> infections and drug resistant malaria 			
<ul style="list-style-type: none"> Describe the chemoprophylaxis used in Sri Lanka 	<ul style="list-style-type: none"> A) Chemoprophylaxis is used in Sri Lanka 			
<ul style="list-style-type: none"> Describe the clinical manifestations of uncomplicated and complicated malaria 	<ul style="list-style-type: none"> A) Clinical manifestations of uncomplicated and complicated malaria 	1 Lecture	45 mts	Medicine

<ul style="list-style-type: none"> Describe the management of severe malaria and its complications 	<ul style="list-style-type: none"> B)Management of severe malaria and its complications eg. Hypoglycaemia, Hyperpyrexia, Acute Renal Failure, Convulsions, Anaemia 	Ward Teaching		Medicine
<ul style="list-style-type: none"> Describe the epidemiology and the current malaria control programme in Sri Lanka 	<ul style="list-style-type: none"> A)The epidemiology and the current malaria control programme in Sri Lanka 	1 Lecture 1 Tutorial	45 minutes 45 minutes	Community Medicine/ Parasitology

Fever

Intermediate objectives	Detail content areas	Activity	Duration	Department
<ul style="list-style-type: none"> Define fever 	<ul style="list-style-type: none"> A) Definition of fever 			Medicine
<ul style="list-style-type: none"> List the probable aetiological agents 	<ul style="list-style-type: none"> A) Cause of fever including non-infective causes 			
<ul style="list-style-type: none"> Take a detailed history from a patient presenting with fever 	<ul style="list-style-type: none"> A) History from a patient presenting with fever 			
<ul style="list-style-type: none"> Identify the physical signs that may be found in a patient presenting with fever 	<ul style="list-style-type: none"> A) Detailed physical examination of a patient presenting with fever 			
<ul style="list-style-type: none"> Discuss the appropriate 	<ul style="list-style-type: none"> A) Management of a patient with fever 	Practical	During Family Medicine attachment	Family Medicine

management of fever in different clinical situations	of <1week's duration - causes - how to diagnose - management	PBL	1 session of 1 ½ hours (2 slots) (2x 45 mts)	Medicine
	<ul style="list-style-type: none"> ● A)PUO <ul style="list-style-type: none"> - causes with emphasis on common infective causes relevant to Sri Lanka - appropriate investigations ● A)The febrile child 	Lecture	45 mts.	Paediatrics

<ul style="list-style-type: none"> Describe the management of dengue and its complications 	<ul style="list-style-type: none"> A) Laboratory diagnosis A) Management 	Ward Teaching		Medicine Paediatrics
<ul style="list-style-type: none"> Know the control measures for the vector 	<ul style="list-style-type: none"> A) Control measures 	1 Lecture	45 minutes	Com Med

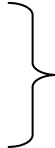
Septicaemia, bacteraemia and shock

Intermediate objectives	Detail content areas	Activity	Duration	Department
<ul style="list-style-type: none"> Define the terms bacteraemia, sepsis, septicaemia and septic shock Describe the pathological mechanisms leading to septic shock 	<ul style="list-style-type: none"> A) Causative agents and predisposing factors B) Systemic inflammatory response A) Interactions between microbial factors and host immune responses 	Fixed learning module 1 Tutorial	45 minutes	Microbiology
<ul style="list-style-type: none"> List the clinical manifestations of septicaemia List the complications of septicaemia 	<ul style="list-style-type: none"> A) General manifestations and signs indicative of specific pathogens A) Cardio-respiratory and renal complications A) Coagulation abnormalities A) Multiple organ dysfunction syndrome 	*Lecture	45 minutes	Medicine

<ul style="list-style-type: none"> List the investigations needed to arrive at a diagnosis and to help in the management of the patient 	<ul style="list-style-type: none"> A) Value of blood cultures in diagnosis A) Collection of samples including the proper technique of drawing blood for blood cultures and number of samples 	Practical	45 minutes	Microbiology
<ul style="list-style-type: none"> Describe the management of septicaemia including septic shock 	<ul style="list-style-type: none"> A) Antibiotic treatment both empiric and specific A) General measures 	*Lecture N.B. * one lecture		Medicine

Antibiotics

Intermediate objectives	Detail content areas	Activity	Duration	Department
<ul style="list-style-type: none"> List the different types of antibiotics Describe the spectrum of activity of these drugs Discuss the indications for the use of different antibiotics- individually and in combinations Describe the pharmacokinetic aspects of these drugs List the methods of administration Describe the important adverse effects, contraindications and precautions for their use Describe the important drug 	<ul style="list-style-type: none"> Betalactams <ul style="list-style-type: none"> * A) Penicillins <ul style="list-style-type: none"> -benzylpenicillin/ phenoxymethyl penicillin/ benzathine penicillin/ procaine penicillin - Penicillinase resistant penicillin - Broad-spectrum penicillins - Antipseudomonal penicillins * A) Cephalosporins <ul style="list-style-type: none"> - 1st, 2nd, 3rd & 4th generations 	1 Lecture Tutorial	45 minutes	Pharmacology
	<ul style="list-style-type: none"> * A) Aminoglycosides * A) Quinolones 	Lecture	45 minutes	
		Lecture	45 minutes	

interactions	<ul style="list-style-type: none"> • A) Imidazoles • A) Macrolides, tetracyclines and chloramphenicol • B) Sulphanamides and urinary antiseptics • C) Newer antibiotics = Introduction to penicillinase resistant antibiotics and antipseudomonal antibiotics 	SDL		
Anti virals Anti fungals	 A)	1 Lecture	2 Tutorials - for all antibiotics, antivirals and antifungals 45 minutes each	45 mts

Visceral Leishmaniasis

Intermediate objectives	Contents	Activity	Duration	Department
<ul style="list-style-type: none"> Outline the geographical distribution 	<ul style="list-style-type: none"> C)The geographical distribution 	FLM		Parasitology
<ul style="list-style-type: none"> Outline the lifecycle and the mode of transmission of <i>L. donavani</i> 	<ul style="list-style-type: none"> C)The lifecycle and the mode of transmission of <i>L. donavani</i> 			
<ul style="list-style-type: none"> Name the vector involved 	<ul style="list-style-type: none"> C)Name of the vector 			
<ul style="list-style-type: none"> Describe the pathogenesis, clinical features, control and prevention of the disease caused by <i>L. donavani</i> 	<ul style="list-style-type: none"> C)The pathogenesis, clinical features, control and prevention of the disease caused by <i>L. donavani</i> 			

Toxoplasmosis

Intermediate objectives	Content	Activity	Duration	Department
<ul style="list-style-type: none"> Outline the lifecycle and modes of transmission of <i>Toxoplasma gondii</i> 	<ul style="list-style-type: none"> A) Lifecycle with reference to diagnosis and modes of transmission 	1 Lecture 1/2 Practical (combined with malaria) 1/2 Tutorial	45 mts	Parasitology
<ul style="list-style-type: none"> Describe the clinical features in relation to the parasites 	<ul style="list-style-type: none"> A) The pathogenesis and clinical features 		22.5 mts	
<ul style="list-style-type: none"> Describe the laboratory diagnostic methods 	<ul style="list-style-type: none"> B) The laboratory diagnostic methods 		22.5 mts	
<ul style="list-style-type: none"> Describe prevention and control 	<ul style="list-style-type: none"> B) Prevention and control 			

Leptospirosis

Intermediate objective	Contents	Learning Activity	Time	Department
<ul style="list-style-type: none">• Discuss the aetiopathogenesis, microbiological basis of lab diagnosis, treatment & prevention of Leptospirosis	<ul style="list-style-type: none">• A) Aetiopathogenesis , microbiological basis of lab diagnosis, treatment & prevention	Lecture	45 mts.	Microbiology
<ul style="list-style-type: none">• Describe the clinical features, investigations and the management of a patient with Leptospirosis	<ul style="list-style-type: none">• A) Clinical features, investigations and the management	Lecture	45 mts	Medicine

Trypanosomiasis

Intermediate objectives	Contents	Activity	Duration	Department
<ul style="list-style-type: none"> Name the species of <i>Trypanosoma</i> that infect man and the diseases caused by these 	<ul style="list-style-type: none"> C) Species of <i>Trypanosoma</i> & and the diseases caused by these 	FLM		Parasitology
<ul style="list-style-type: none"> Outline the geographical distribution 	<ul style="list-style-type: none"> C) Geographical distribution 			
<ul style="list-style-type: none"> Name the vectors & outline the life cycles 	<ul style="list-style-type: none"> C) Vectors & the life cycle 			
<ul style="list-style-type: none"> Describe the pathogenesis, clinical features, control and prevention 	<ul style="list-style-type: none"> C) Pathogenesis, clinical features, control and prevention 			
<ul style="list-style-type: none"> Outline the treatment in relation to the parasite 	<ul style="list-style-type: none"> C) Treatment 			Parasitology

Recommended Reading-Latest editions of the following

Microbiology

Basic and Clinical Immunology
Daniel P Stites, Abbas I Tever, Tristram G Parslow

Microbiology in Clinical Practice
D C Shanson

Medical Microbiology
Cedric A Mimms, John H L Playfair, Ivan M Roitt, Derek Wakelin and Rosamund Williams

Immunobiology
The immune system in health and disease
Janeway & Travers

Medical Microbiology
David Greenwood, Richard C B Sluck

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Pathology

Robbins & Cotran Pathologic Basis of Disease.
Kumar, Abbas, Fausto

Muir's Textbook of Pathology
McSween, Whaley

Pathology Illustrated
P.S. Macfarlane, Reid, Robin

Pharmacology

Books
Clinical Pharmacology
P. N. Bennet, M. J. Brown
Publisher : Churchill Livingstone

Rang And Dale's Pharmacology
H. P. Rang, M. M. Dale, J. M. Ritter, R. J. Flower
Publisher: Churchill Livingstone

Oxford textbook of Clinical Pharmacology & Drug Therapy
Grahame Smith, J K Aronson
Publisher: Oxford University Press

Pharmacological Basis of Therapeutics
Goodman & Gilman
Publisher: Mc-Graw Hill

Basic & Clinical Pharmacology
Katzung, B.G.
Publisher: Mc-Graw Hill

Journals

Sri Lanka Prescriber

Drug and Therapeutics Bulletin - UK

Australian Prescriber

Medicine

Clinical Medicine
Parveen J. Kumar, Michael L. Clark

Davidson's Principles & Practice of Medicine
Christopher Haslett, Edwin R. Chilvers, Nicholas A. Boon, Nicki Colledge, John A. Hunter

Parasitology

Basic Clinical Parasitology
Franklin A. Neva & Harold W. Brown
Publisher: Prentice Hall International Inc.

Medical Parasitology
R L J Muller & Baker
Publisher: Gower Medical Publishing 1989

Manson's Tropical Diseases
P E C Manson Bahr & Bell
Publisher: Balliere- Tindall/ ELBs

Bruce- Chwatt's Essential Malariology
H W Gilles & D A Warrel
Publisher: Edward Arnold, Hodder & Stoughton, UK