«Тропические инфекции »

Общая трудоемкость	Изучение дисциплины составляет 2 кредитов (60 часов)
Цель дисциплины	формирование у обучающихся системы теоретических знаний и практических компетенций по распознаванию, диагностике, лечению, профилактике и контролю тропических инфекционных заболеваний с использованием клинического мышления, лабораторной интерпретации и принципов доказательной медицины в рамках подхода *One Health.*
Задачи обучения	• знаний об этиологии, эпидемиологии, патогенезе и клинических проявлениях тропических инфекций; • навыков клинической диагностики и дифференциальной диагностики; • умений интерпретировать лабораторные и инструментальные методы исследования; • компетенций по назначению рациональной терапии и ведению пациентов; • навыков проведения профилактических и противоэпидемических мероприятий; • понимания междисциплинарного подхода (One Health) и глобальных аспектов общественного здравоохранения.
Содержание разделов учебной программы	Введение в тропическую медицину Общие закономерности инфекционного процесса Методы диагностики тропических инфекций Вирусные тропические инфекции Паразитарные заболевания Риккетсиозы и трансмиссивные инфекции Тропические лихорадочные синдромы
В результате изучения дисциплины студент должен:	*Знает и понимает:* • знает основные понятия тропической медицины и медико-географические особенности распространения инфекций; • понимает этиологию, эпидемиологию и патогенез тропических инфекционных заболеваний; • знает классификацию тропических инфекций (вирусные, паразитарные, трансмиссивные); • понимает механизмы передачи инфекций и роль факторов окружающей среды; • знает клинические проявления и осложнения тропических заболеваний; • понимает принципы лабораторной диагностики (микроскопия, серология, ПЦР); • знает современные подходы к лечению и профилактике тропических инфекций; *Умеет:* • рименять знания для диагностики и ведения пациентов; • анализировать клинические случаи;

	• принимать обоснованные клинические решения; *Владеет:* • владеет навыками сбора эпидемиологического и клинического анамнеза; • владеет методами клинического осмотра пациентов с подозрением на тропические инфекции; • умеет проводить дифференциальную диагностику лихорадочных состояний; • владеет навыками интерпретации лабораторных данных; • умеет составлять алгоритмы диагностики и лечения; • владеет принципами назначения этиотропной и патогенетической терапии; • умеет разрабатывать профилактические и противоэпидемические мероприятия;
Перечень формируемых компетенций	ПК- 10, ПК-14, ПК-17
Виды учебной работы	Лекционные и практические занятия
Отчетность	Экзамен

Анкета преподавателя

Ф.И.О. преподавателя	Абдимомунова Бегимай Токтоболотовна
Название дисциплины	Инфекционные болезни
Должность и звания	Старший преподаватель
Базовые образование	Медицинской факультет специальность Лечебное дело. Интернатура в КГМА, внутренние болезни, переквалификацию «Инфекционные Болезни».
Работа вдругих учреждениях	ОММУ
Опыт академической или производственной работы в предметной или смежных областях	2015-2016гг. Интернатура врач-терапевт в КГМА 2016-2017гг Ассистент-преподаватель кафедры общественного здоровья и здравоохранения, ММФ 2017-2022гг. преподаватель кафедры ОЗиЗ С 2022г - Старший преподаватель кафедры ОзиЗ.
Общественная работа	Руководитель программы магистратуры «Общественное здравоохранение» кафедры Общественное здравоохранение с курсом доказательной медицины.
Научно-исследовательская деятельность и предметной или смежных областях	Клинико-лабораторная характеристика новой коронавирусной инфекции на примере Ошской области.
Членство в научных и профессиональных обществах	Член ассоциации ифекционистов и гепатологов Кыргызской Республики
Опубликованные работы (за последние 3 года)	1.Особенности начала заболеваемости Covid-19 В Сузакском районе Джалал-Абадской Области (Кыргызстан). Блютень науки и практики eISSN: 2414-2948. 2.Вспышки кори и краснухи в ошской области кыргызской республики -2023-г. (январь май месяц) / Абдимомунова Б.Т., Даутов Т.Т., Турусбекова А.К., Абжапарова А.З. // Здравоохранение Кыргызстана. 2023. № 2. С. 58-65. 3.Эпидемиологические особенности заболеваемости бруцеллезом сельского населения джалал-абадской области кыргызской республики за 2022 год /Темирова В.Н., Темиров Н.М., Салиева С.Т., Абдимомунова Б.Т., Ураимов Р.К., Жолдошев С.Т. // Бюллетень науки и практики. 2023. Т. 9. № 8. С. 118-125. 4.Эффективность вакцинации взрослого населения города Джалал-Абад против вирусного гепатита / Темиров Н.М., Темирова В.Н., Абжапарова А.З., Абдимомунова Б.Т., Жолдошев С.Т. // Бюллетень науки и практики. 2023. Т. 9. № 8. С. 111-117 5.Вакцинация против новой инфекции covid-19 - дорога к успеху, быть в зеленой зоне Кыргызской Республики / Абдимомунова Б.Т., Жолдошев С.Т., Даутов Т.Т., Темиров Н.М. // Бюллетень науки и практики. 2023. Т. 9. № 7. С. 222-229. 6.Сахарный диабет 2 типа у больных COVID-19 в Ошской области / Рысбекова Г.С., Абдимомунова Б.Т., Жолдошев С.Т., Турсунбекова Д.Т. // Тенденции развития науки и образования. 2023. № 95-5. С. 49-57. 7.Medical and social aspects of the new coronavirus infection / Abdimomunova B.T., Zholdoshev S.T. // European Journal of Natural History. 2023. № 3. С. 9-17. 8.Сахарный диабет 2 типа как фактор риска тяжелого течения COVID-19 / Рысбекова Г.С., Абдимомунова Б.Т., Жолдошев С.Т., Турсунбекова Д.Т. // Санитарный врач. 2023. № 5. С. 331-334 9.Клинико-иммунологические особенности covid-19 на разных стадиях течения болезни / Абдимомунова Б.Т., Жолдошев С.Т. // Санитарный врач. 2023. № 3. С. 146-152. 10.Dengue Fever in Pregnant Women with a Favorable Outcome. Kalybekova K.D., B.T. Abdimomunova, Akzholtoeva A.A., Iyngaran Abinaya. Sch J App Med Sci, 2024 Nov 12(11): 1496-1501. 11.Assessing health behaviors among students: a survey analysis// Abdimomunova B.T. Eman Firdous. Norwegian Journal of development of the International Science No

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Награды и премия	1. Почетная грамота Ошского городского кенеша за добросовестный труд, профессионализм и вклад в образование при подготовке будущих докторов. 2. Почетная грамота Ошского областного комитета профсоюза образования и науки. 3. Почетная грамота международного медицинского факультета Ошского государственного университета
Повышения квалификации (за последние 3 года)	**2023** - Семинар -тренинг «Исследовательская этика и этическая экспертиза научных исследований» в обьеме 12 часов. г.Ош **2023** - Повышение квалификации «Зоонозные инфекции». г.Шымкент, Казахстан **2024** - Основы научных исследований в количество 72 ч. Г. Бишкек **2024** - Участник международной наусной-практической конференции «Актуальные проблемы современной практической медицины в условиях новых вызовов: инновационные технологии в образовании и практики» **2024** - Участник международной конференции «The use of high innovative technologies in preventive medicine», г. Андижан Узбекистан **2024** - Участник международной научно-практической конференции " Актуальные вопросы современной медицины. От природы к человеку", приуроченной 85-летию ОшГУ, а также посвященной 80-летию доктора медицинских наук, профессор Джолдубаева Ырысбек Джолдубаевича. 6 кредит часов. Г. Ош

REVIEW

of the educational and methodological complex (EMC) of the discipline *"Tropical Infections"*
(Osh International Medical University)

As the Head of the Adult Infectious Diseases Department, I have reviewed the submitted educational and methodological complex (EMC), including the syllabus, assessment tools (FOS), methodological guidelines for lectures and practical classes, as well as the glossary.

The syllabus demonstrates a well-structured and comprehensive approach to teaching tropical infectious diseases. It fully reflects modern requirements for training medical students within the framework of global health challenges and the *One Health* concept. The course content appropriately integrates key aspects such as etiology, epidemiology, pathogenesis, clinical manifestations, diagnosis, treatment, and prevention of tropical infections.

The stated learning outcomes are clearly formulated and aligned with professional competencies, particularly in the areas of diagnostic, therapeutic, and preventive activities. Special attention should be noted regarding the development of clinical thinking and decision-making skills in students.

The Fund of Assessment Tools (FOS) is diverse and includes oral questioning, situational tasks, test control, and interactive learning formats such as PBL, TBL, and role-playing simulations. This ensures an objective and comprehensive evaluation of students' theoretical knowledge and practical competencies.

Methodological developments for lectures and practical classes are logically structured, contain clearly defined educational goals, step-by-step plans, and modern teaching technologies. The inclusion of case-based learning, algorithm development, and clinical reasoning tasks significantly enhances the practical orientation of the discipline.

The glossary is relevant and contributes to the formation of professional medical terminology in English, which is especially important for international medical education.

The content of the EMC corresponds to international standards (WHO, CDC, evidence-based medicine principles) and reflects актуальные эпидемиологические и клинические изменения в инфекционных заболеваниях.

Recommendations:

- Expand sections on emerging and re-emerging tropical infections
- Include more region-specific epidemiological data (Central Asia)
- Enhance digital learning tools and simulation-based training

Conclusion:

The educational and methodological complex meets modern academic and clinical requirements and can be recommended for implementation in the educational process of medical universities.

Head of Adult Infectious
Diseases Department of Osh city hospital **Satybaldiev Mederbek Myrzaevich**

РЕЦЕНЗИЯ
на учебно-методический комплекс (УМК) по дисциплине
«Тропические инфекции»

Представленный учебно-методический комплекс (УМК), включающий силлабус, фонд оценочных средств (ФОС), методические разработки лекционных и практических занятий, а также глоссарий, разработан на высоком учебно-методическом уровне и соответствует современным требованиям медицинского образования.

Силлабус дисциплины отличается четкой структурой, логической последовательностью и полнотой содержания. В нем отражены основные разделы тропической медицины, включая этиологию, эпидемиологию, патогенез, клиническую картину, диагностику, лечение и профилактику инфекционных заболеваний. Особое внимание уделено формированию клинического мышления и навыков принятия решений.

Фонд оценочных средств характеризуется разнообразием форм контроля: устный опрос, тестирование, решение ситуационных задач, а также использование современных образовательных технологий (PBL, TBL, CBL, ролевые игры). Это обеспечивает объективную и всестороннюю оценку знаний, умений и компетенций обучающихся.

Методические разработки лекционных и практических занятий отличаются высокой степенью проработки. Они содержат цели, задачи, план проведения занятий, контрольные вопросы и практико-ориентированные задания, направленные на развитие аналитических и клинических навыков студентов.

Глоссарий является важным компонентом УМК, способствующим формированию профессиональной терминологии, особенно в условиях англоязычного обучения.

Содержание УМК соответствует международным стандартам (ВОЗ, CDC) и принципам доказательной медицины, что делает его актуальным и востребованным в подготовке современных медицинских кадров.

Заключение:
Учебно-методический комплекс по дисциплине «Тропические инфекции» соответствует требованиям высшего медицинского образования и может быть рекомендован к внедрению в образовательный процесс.

Профессор кафедры клинических дисциплин Жолдошев Сапарбай Тезекбаевич

MINISTRY OF SCIENCE, HIGHER EDUCATION AND INNOVATION OF THE KYRGYZ REPUBLIC

OSH INTERNATIONAL MEDICAL UNIVERSITY

DEPARTMENT OF CLINICAL DISCIPLINE

Syllabus

Specialty	**General Medicine**	**Code of course**	**560001**
language of instruction	English	Discipline	Tropical Infection
Academic year	2025-2026	Number of credits	2 credits
Lecturers	assoc.professor Abdimomunova B.T.,	Course_4_, semester VIII Number of border controls _1_, exam _VIII_semester	**Overall labor intensity 60 hours, including: Total classroom hours 30 (lectures - 12 hours, practical classes – 18 hours) SIW – 30 hours**
E-Mail	babdimomunova@oimu.kg	Place of work	Osh International Medical University, Lenina 428
Form of education (full-time/part-time/evening)	Full-time	Course type: (mandatory/elective)	mandatory

Osh – 2026

1. Course description: This course provides an integrated overview of tropical infectious diseases, focusing on their etiology, epidemiology, pathogenesis, clinical manifestations, diagnosis, treatment, prevention, and control, with particular attention to conditions prevalent in tropical and subtropical regions of major public health importance.

2.Objective of the course: to equip students with comprehensive knowledge and practical competencies to recognize, diagnose, manage, prevent, and control major tropical infectious diseases through clinical reasoning, laboratory interpretation, and evidence-based public health approaches within the One Health framework.

Prerequisites	Anatomy, pathological anatomy, normal physiology and pathological physiology, microbiology, virology, immunology, pharmacology, hygiene, public health dermatology, otorhinolaryngol, propedeutics of internal diseases
Postrequis	Internal medicine, pediatrics, evidence-based medicine, family medicine, surgical diseases, epidemiology
Co- quisites (if necessary)	

Learning outcomes of the discipline

By the end of the course the student:

LO (learning outcomes) BEP	LO	Competences
LO 6- able to apply basic knowledge in the field of preventive activities to solve professional problems.	students will be able to apply basic knowledge of infectious disease prevention and control to solve professional problems in clinical practice and public health	PC-10 is capable of carrying o anti-epidemic measures, protecting the population in th focus of particularly dangerou infections, in case of worsenin radiation conditions, and durin natural disasters.
LO 7- able to apply basic knowledge in the field of diagnostic activity to solve professional problems.	students will be able to apply basic knowledge of diagnostic methods for infectious diseases to identify pathogens, interpret laboratory and clinical findings, and solve professional problems	PC-14 is capable and ready for diagnosis based on the results of biochemical and clinical studies, taking into account the course of pathology in organs, systems and the body as a

	in patient care and epidemiology.	whole.
LO 8- able to apply basic knowledge in the field of medical activity to solve professional problems.	students will be able to apply basic knowledge of medical management of infectious diseases to plan treatment, monitor patients, and implement evidence-based therapeutic strategies in solving professional problems	PC-17 is capable of prescribing appropriate treatment to patients in accordance with the diagnosis.

1. **Technological map of the discipline**

Recommended technological map for two modules in the context of one semester

Total hours		Aud.lessons	Lectures	Practical classes	ISW	8th semester				Final control (60p.)
						Module (60 p.)			Boundary control	Exam
						Lectures	Practical classes	ISW		
60		30	12	18	30	12	18	30		40
	Points					30	30	30	30	60
	Total modules					C1==30+30+30+30=60				F=40p
	Total score					C=C1+F=60+40=100p. 87-100-excellent 74-86 - good 61-73-satisfactory 0-60 - unsatisfactor				

6. SUBJECT SCORING CARD

Form of control	TK1
Oral survey	10
Solving a situational problem (Interpretation of analysis)	10
Student^s activity: PBL, TBL, RBL, CBL, Rolegame patient-doctor	10
Total	30

Evaluation criteria for the discipline "Tropical Infections" (1 lecture session)

Students in order to receive 30 lecture points must comply with the following rules:

visiting a lecture - 2 p
- discussion with the lecturer -2 p
- final test control -6 b
- development of a virtual situational task

Students in order to receive 10 practical points must comply with the following rules:

. Oral survey:
- full disclosure, generalization of the topic, answers all questions asked (10 b)
- incomplete disclosure of the topic, cannot conduct differential diagnostics, answers half of the questions asked (6 b)
- does not have a complete understanding of the topic, cannot explain the pathogenesis, does not answer the questions asked (3 b)
- the student is not ready for the lesson - (0 pts).

2. Solving situational tasks: - to make a preliminary diagnosis.
- interpretation of physical data
- interpretation of laboratory analyzes.
- prescribe treatment
- prescribe a recommended diet
- medical and recreational activities.

Evaluation criteria:
1. If all points (10 b) are correct 2. - If it is correct 1,2,3,4 points (6 b) 3.if 1.2 point is correct (3 b)

3.Student activity: TBL, PBL, Role game patient-doctor, RBL, CBL.
TBL
Manifestation of help
- Job Orientation
- Time management
- Balanced participation
- Effective interpersonal communication

• Conflict management sick
• Constructive feedback
• Adherence to rules

PBL

- Discussion of the evaluation plan
- Setting rules for small group work
- Presentation of a clinical case
- Identification of the main problems
- Identification of contributing factors
- Description of the main mechanisms and formulation of problematic issues

Role game patient-doctor

Creation of an object-playing space in a group, taking into account the individual and age characteristics of patients
The level of game activity planning
Creation of a favorable psychological climate for communication in the process of gaming activities with patients
The level of understanding, recognition, acceptance of co-creation, cooperation of the patient by the doctor
The level of creating a situation of success in gaming activities
Effective assistance to patients in self-expression by means of gaming activities
Using an individually differentiated approach to patients in gaming activities

❖ **Grading for individual work of student (self-work)**

1. Writing a scientific article
2. Writing an idea for a Startup
3. Analysis of statistical data(4.1, 4.2, 4.3, 4.4, 4.5)

2. Calendar-thematic plan of lectures

№ the name of the theme	Plans and questions	Number of hours.	Literature	Used educational technologies	Weeks
1. Introduction to tropical medicine. Amoebiasis.	**1.Geography of tropical infectious and parasitic diseases.** **2. The concept of infection Infectious process, the main forms of the infectious process.** **3.The main methods of diagnosis of infectious diseases.** **4.General principles of treatment of infectious diseases.** **4.Etiology and epidemiology of Amoebiasis.** **5. The pathogenesis and clinical picture of Ameobiais.** **6.Diagnosis differential diagnosis of Ameobiais.** **7. Treatment and Prevention.** *Control question:* *1.Tell us the classification of tropical infectious diseases?*	2	1.2.3.4	PPT	1

	2.What pathways of transmission of infectious diseases do you know? *3. Tell us the main types of fever?*				
2.Hemorrhagic viral fevers. Dengue, Marburg, Ebola, Crimea-Congo, Hanta	**1.General characteristics of hemorrhagic viral fevers.** **2.Epidemilogy of viral hemorrhagic fevers: Dengue, Crimea -Congo.** **3.Pathogenesis and clinical manifestation of VHF.** **4.Diagnosis and treatment of VHF.** **5.Preventions of VHF.** *Control question:* *1.Tell us the classification of VHF.* *2.What pathways of transmission of VHFdo you know?* *3. Tell us the main types of skin rashes?*	2	1.2.3.4.5	PPT	1
3. Viral Hemorrhagic fevers with renal syndromes. Etiology,	**1.Etiological characteristic of the pathogens of VHF with renal syndromes.** **2. Which of them cause pathology in humans?** **3. Sources of infection, mechanism of infection and pathways of transmission of pathogens.** **4. Incubation period and tell us about the periods of the disease** **5. Measures for the prevention of VHF.** Control questions 1.Give an idea of the risk factors characteristic of VGL. 2.Specify the main methods of diagnosis of 3.Name the continents and countries where cases of diseases caused by the causative agent of VHF.	2	1.2.3.4.5	PPT	2
4. Malaria. (P.vivax, P. palciparum, P.ovale, P. malaria)	**1.Etiology, epidemiology, pathogenesis, clinical manifestations.** **2.The life cycle of the parasite.** **3.Epidemiology: the source of infection, mechanisms of transmission, the biology of vectors and the geographical distribution of different species of malaria.** **4.Clinical manifestations: the period of primary manifestations, relapses. Features of the malaria clinic, depending on the type of plasmodium. 5.Complications and malignant forms of tropical malaria: malarial coma(cerebral malaria), acute renal failure, malarial algid, hemoglobinuric fever, ruptured spleen, pulmonary edema, hypoglycemia.**	2	1.2.3.4.5	PPT	2

	6.Diagnosis and treatment of malaria Control questions 1. Tell the classifications of antimalaria drugs, 2. When was the last outbreaks of malaria, 3. Complications of malaria in pregnancy.				
5. Leishmaniasis, Japanese encephalitis.	**1.Etiology,** **2.Epidemiology,** **3.Pathogenesis** **4. Clinical features.** **5.Diagnosis,** **6.Complications,** **7.Treatment** **8.Prevention.** Control questions 1. Risk factors at leishmaniasis 2. Life cycle of JE 3. Vectors for transmissions of leishmaniasis.	2	1.2.3.4.5	PPT	**3**
6. Trypanosomiasis, Filariasis.	**1.Etiology,** **2.Epidemiology** **3.Pathogenesis** **4. Clinical features.** **5.Diagnosis** **6.Complications** **7.Treatment** **8.Prevention.** Control questions: 1. Specify the sources of invasion 2. Prove the mechanisms and ways of transmission 3. Names the antiparasitic medicines				
Total	**24 hours**				

Calendar-thematic plan of practicals

№ the name of the theme	Сем №	Questions and tasks to be studied	Number of hours.	Points	Literature	Used educational technologies	Weeks
1	2	3	4	5	6	7	8
Topic 1. 1.1 Introduction to tropical medicine 1.2 Amoebiasis etiology, epidemiology,	1	Plan: 1. Tell us the concept of the tropics. Medico-geographical concept. 2. Discover the influence of environmental factors on the	2	1	1, 3, 8, 12, 17	slide, posters, RI video	1-я

pathogenesis, clinic, diagnosis, treatment, prevention.		health of the population of the tropics: the role of soil and water in the spread of infections and infestations in the tropics, the impact of a hot climate on the human body. 3. Tell us the general features of tropical pathology. Geography of tropical infectious and parasitic diseases. 4.. Name the etiology, explain the transmission pathways and pathogenesis of amoebiasis. 5. Describe the clinical manifestations of amoebiasis. 6. Choose diagnostic methods and make a treatment plan for amoebiasis 7. Recommend methods of prevention of amoebiasis 8. Tell us the complication of amoebiasis. What are the etiological factors of the development of Japanese encephalitis? 5. Make a diagnostic algorithm for detecting Japanese encephalitis. 6. Explain the pathogenesis and clinical picture of the disease.					
Topic 2. 1.1 Hemorrhagic viral fevers 1.2 Dengue, Marburg, Ebola, Crimea-Congo, Hanta, etiology, epidemiology, pathogenesis, clinic, diagnosis, treatment, prevention.	2	Plan: 1. Expand the concept of hemorrhagic viral fevers and classify them. 2. What are the etiological factors for the development of hemorrhagic viral fevers? 3. Explain the pathways of disease transmission 4. Explain the clinical picture of the disease. 5. Differentiate Dengue, Marburg, Ebola with TORI 6.Make a treatment plan based on the severity of the disease. 7. Recommend prevention methods	2	1	2, 3, 5, 11, 16	slide, posters, RI video	2-я
Topic 3. 1.1 Hemorrhagic fever with renal syndrome etiology,	3	Plan: 1. Tell the etiology of the disease.	2	1	1, 2, 7, 12	slide, posters, RI video	3-я

epidemiology, pathogenesis, 1.2 clinic, diagnosis, treatment, prevention		2. Name the epidemiological features of the disease. 3. Demonstrate the pathogenesis using a diagram. 4. Describe the clinical features of hemorrhagic fever with renal syndrome 5. Make a treatment plan based on severity 6. Recommend prevention methods . 7. Predict the outcome of the disease and tell the complications of hemorrhagic fever with renal syndrome.					
Topic 4. 1.1. Malaria. Etiology, epidemiology, pathogenesis, clinical manifestations. Complications, diagnosis,	4	Plan 1. Expand the concept of malaria 2. Explain the breeding cycle of malarial plasmodium. 3. What are the etiological factors of malaria development? 4. Make up an algorithm for the pathogenesis of the disease. 5. Classify the forms of malaria 6. Explain the clinical picture of the disease, typical malarial paroxysms, with the classical Tareev triad. 7. Tell us the complication of malaria. 8. Make a diagnostic algorithm for the disease malaria. 9. Make a treatment plan for malaria, depending on the severity of the disease. 10. Discuss the stages of diet therapy in the treatment of malaria and medical examinations 11. Recommend prevention methods for malaria	2	1	6, 12, 15, 16	slide, posters, RI video	4-8
Topic 5 Malaria in Children and Pregnant Women	5	Plan 1.Expand the concept of malaria in children and pregnant women, highlighting its epidemiological importance and public health impact in endemic regions. 2.Describe the etiology of malaria in children and pregnant women, including the causative	2	1	2,3,4, 5	slide, posters, RI video	5-8

		Plasmodium species and transmission characteristics. 3.Explain the pathogenesis of malaria in children and pregnant women, emphasizing immunological factors, placental malaria, and mechanisms leading to severe disease. 4.Describe the clinical manifestations of malaria in children and pregnant women, distinguishing between uncomplicated and severe forms of the disease. 5.Develop a treatment plan for malaria in children and pregnant women, according to disease severity, age, gestational period, and current WHO recommendations. 6.Recommend preventive and control measures for malaria in children and pregnant women, including individual, community-based, and public health strategies.					
Topic 6. 1 Leishmaniasis, etiology, epidemiology, pathogenesis, clinic, diagnosis, treatment, prevention.	6	Plan 1. Expand the concept of leishmaniasis 2. Tell us the etiology of leishmaniasis and Japanese encephalitis. 3. Explain the pathogenesis of leishmaniasis and Japanese encephalitis. 4. Describe the clinical manifestations of leishmaniasis and Japanese encephalitis. 5. Make a treatment plan for leishmaniasis and Japanese encephalitis, depending on the degree of the disease. 6. Recommend prevention methods for leishmaniasis and Japanese encephalitis. 7. Tell us the main clinical manifestations of visceral leishmaniasis 8. Tell us the features of the clinic of cutaneous leishmaniasis.	2	1	2, 4, 12	slide, posters, RI video	6-я

Topic 7. Rickettsiosis		Plan 1.Expand the concept of Japanese encephalitis, emphasizing its epidemiological significance, geographic distribution, and importance for public health in endemic regions. 2.Describe the etiology of Japanese encephalitis, including the characteristics of the virus, reservoirs, vectors, and modes of transmission. 3.Explain the pathogenesis of Japanese encephalitis, highlighting viral neuroinvasion, immune response, and mechanisms of central nervous system damage. 4.Describe the clinical manifestations of Japanese encephalitis, distinguishing between mild infection, encephalitic forms, and severe complications in children and adults. 5.Develop a management and treatment plan for Japanese encephalitis, depending on disease severity, with emphasis on supportive care and management of neurological complications. 6.Recommend preventive and control measures for Japanese encephalitis, including vaccination strategies, vector control, and public health interventions.	2	1	1,4,5, 7	slide, posters, RI video	7-я
Topic8 . Helminth / Nematodes	8	Plan. 1. Expand the concept of trypanosomiasis. 2. Name the etiology of trypanosomiasis. 3. Demonstrate the pathogenesis on the scheme of trypanosomiasis. 4. Classify trypanosomiasis. 5. Describe the clinical manifestations of trypanosomiasis. 6. Choose diagnostic methods and make a treatment plan for trypanosomiasis discuss the complications of trypanosomiasis.	2	1	2, 3, 7, 11	slide, posters, RI video	8-я

		7. Recommend prevention methods for trypanosomiasis					
Topic9 . Cestodes / Trematodes		1.Expand the concept of filariasis, outlining its definition, epidemiological significance, geographic distribution, and public health impact in tropical and subtropical regions. 2. Describe the etiology of filariasis, including the main causative agents (Wuchereria bancrofti, Brugia malayi, Brugia timori), vectors, and modes of transmission. 3.Explain the pathogenesis of filariasis, focusing on lymphatic involvement, immune-mediated mechanisms, and the development of chronic complications. 4.Describe the clinical manifestations of filariasis, distinguishing between asymptomatic infection, acute filarial attacks, and chronic forms such as lymphedema, elephantiasis, and hydrocele. 5.Develop a treatment plan for filariasis, depending on the stage and severity of the disease, including antiparasitic therapy and management of chronic complications. 6.Recommend preventive and control measures for filariasis, including vector control, mass drug administration programs, personal protection, and public health strategies.	2	1	1.2.3. 4.5.6.	slide, posters, RI video	9-я
Total			**18**				

13.3. Independent student work(ISW)

№	Theme	Assignment for Independent Study	Hours	Assessment Methods	Points	References	Submission Deadline
1	Overview of Tropical Infectious Diseases	Preparation of a concise analytical summary on the global burden and classification of tropical	4	Written summary	2	1. WHO Tropical Diseases Overview 2. CDC Tropical Medicine Resources	2nd week

		infectious diseases					
2	Vector-Borne Tropical Infections	Comparative table of major vector-borne diseases (malaria, dengue, chikungunya, leishmaniasis)	4	Comparative table	2	1. WHO Vector-Borne Diseases Reports 2. CDC Arboviral Diseases	3rd week
3	Malaria in Children and Pregnant Women	Analysis of a clinical case focusing on diagnosis, complications, and management	4	Case report	2	1. WHO Malaria Guidelines 2. Harrison's Principles of Internal Medicine	4th week
4	Neglected Tropical Diseases (NTDs)	Preparation of an infographic on one selected NTD (filariasis, schistosomiasis, leishmaniasis)	4	Infographic + short presentation	2	1. WHO NTD Roadmap 2021–2030 2. FAO / CDC NTD resources	5th week
5	Tropical Febrile Illnesses	Development of a differential diagnosis algorithm for acute febrile illness in tropical regions	4	Algorithm / flowchart	2	1. WHO Clinical Guidelines 2. CDC Yellow Book	6th week
6	Tropical Infections and One Health	Short report illustrating the One Health approach in the prevention of tropical zoonotic infections	5	Written report + discussion	2	1. WHO One Health Joint Plan of Action 2. OIE / FAO resources	7th week
7	Evidence-Based Tropical Medicine	Critical appraisal of a recent scientific article (last 5 years) on tropical infectious diseases	5	Article review	2	1. PubMed (recent articles) 2. Oxford EBM Toolkit	8th week
Total	**30 hours**						

Course Policy

Students are expected to attend all lectures and practical sessions and to participate actively in course activities. Attendance, engagement, and timely completion of assigned work are integral components of the assessment process, and unexcused absences may result in grade penalties in accordance with university regulations.

Academic integrity is a fundamental requirement of this course. All submitted work must be original and properly referenced. Plagiarism, cheating, or any form of academic misconduct will result in disciplinary action, including loss of credit or failure of the assignment or course, as determined by institutional policies.

All assignments, articles, and SIW tasks must be submitted by the specified deadlines; late submissions may be subject to penalties or receive no credit. Retakes and grade appeals are conducted in accordance with official university procedures. The use of electronic devices is permitted only for instructor-approved academic purposes. Faculty office hours are available for consultations, and students are encouraged to seek academic guidance as needed.

Learning Resources

Electronic resourses	1. https://pubmed.ncbi.nlm.nih.gov/ 2 https://www.sciencedirect.com/ 3. www.emedicine.medscape.com 4. www.us.elsevierhealth.com
Electronic textbooks	1. **Manson's Tropical Diseases**, 24th Edition, Farrar J., Hotez P., Junghanss T., Kang G., Lalloo D., White N., Elsevier, 2021 2. **Hunter's Tropical Medicine and Emerging Infectious Diseases**, 10th Edition, Ryan E.T. et al., Elsevier, 2020 3. **Harrison's Principles of Internal Medicine** (sections on tropical infections and HIV), 20th Edition, McGraw-Hill, 2018 4. **Red Book: Atlas of Pediatric Infectious Diseases** (HIV and tropical infections sections), American Academy of Pediatrics, 2024
Textbooks (library)	1. Harrison s «Infectious diseases» 3rd Edition 2023y

	2. K. Park «Preventive and Social Medicine» 24th edition 2024y 3. Davidson s «Principles and Practice of Medicine» 22nd Edition 4. Harrison s «Internal medicine» 19th Edition 2023

МИНИСТЕРСТВО НАУКИ, ВЫСШЕГО ОБРАЗОВАНИЯ И ИННОВАЦИЙ КЫРГЫЗСКОЙ РЕСПУБЛИКИ

Ошский международный медицинский университет

Кафедра клинических дисциплин

«Согласовано» _____
Председатель УМС ОММУ
_____Орунбаева Б.М.
от "___" _____ 2025 г

«Утверждено»_____
на заседании кафедры, протокол №__
от "___" _____ 2025 г.
зав. каф. ____ к.м.н. Абдимомунова Б.Т.

ФОНД ОЦЕНОЧНЫХ СРЕДСТВ (ФОС)

по дисциплине: **«Тропические инфекции»**

для специальности: 560001 – Лечебное дело

Разработчик: Абдимомунова Б.Т.

Ош, 2025

№	Наименование темы	Компетенции	Планируемые результаты обучения дисциплины	Оценочные средства
1	Introduction to Tropical Medicine. Amoebiasis	ПК-15	• Раскрывает медико-географическое понятие тропиков • Объясняет влияние факторов среды на здоровье • Описывает этиологию, патогенез, клинику амебиаза • Обосновывает методы диагностики и лечения	Устный опрос, тест
2	Hemorrhagic Viral Fevers (Dengue, Ebola, Marburg, CCHF, Hanta)	ПК-15	• Классифицирует геморрагические лихорадки • Объясняет пути передачи и патогенез • Анализирует клиническую картину • Составляет план лечения и профилактики	Ситуационные задачи, тест
3	Hemorrhagic Fever with Renal Syndrome	ПК-15	• Описывает этиологию и эпидемиологию • Демонстрирует патогенез • Анализирует клинику и осложнения • Обосновывает лечение и профилактику	Устный опрос, реферат
4	Malaria	ПК-15	• Объясняет жизненный цикл плазмодия • Классифицирует формы малярии • Интерпретирует клиническую картину • Составляет диагностический алгоритм	Тест, устный опрос
5	Malaria in Children and Pregnant Women	ПК-15, ОПК-6	• Анализирует особенности течения малярии • Объясняет патогенез у уязвимых групп • Разрабатывает план лечения по рекомендациям WHO • Обосновывает профилактику	Презентация, тест
6	Leishmaniasis and Japanese Encephalitis	ПК-15	• Описывает этиологию и патогенез • Сравнивает клинические формы • Разрабатывает схемы лечения • Предлагает профилактические меры	Устный опрос, ситуационные задачи
7	Rickettsiosis and Japanese Encephalitis	ПК-15	• Анализирует эпидемиологию • Объясняет нейропатогенез • Интерпретирует клинику • Разрабатывает лечебную тактику	Тест, реферат

8	Trypanosomiasis and Nematodes	ПК-15	• Описывает этиологию и классификацию • Объясняет патогенез • Интерпретирует клинические проявления • Обосновывает лечение	Устный опрос, таблицы
9	Filariasis, Cestodes, Trematodes	ПК-15	• Объясняет патогенез филяриоза • Анализирует клинические формы • Разрабатывает терапию • Обосновывает меры контроля	Презентация, тест

№	Наименование темы	Компетенции	Планируемые результаты обучения дисциплины	Оценочные средства
1	Tropical Medicine Basics and Amoebiasis	ПК-15	Студент объясняет особенности тропической патологии; анализирует амебиаз; формирует диагностический и лечебный подход	Устный опрос, тест
2	Hemorrhagic Fevers	ПК-15	Студент дифференцирует геморрагические лихорадки; анализирует клинику; составляет план лечения	Ситуационные задачи
3	HFRS	ПК-15	Студент интерпретирует клинические данные; оценивает тяжесть; предлагает лечение	Устный опрос, тест
4	Malaria Diagnostics	ПК-15	Студент анализирует мазки крови; интерпретирует результаты; формулирует диагноз	Тестирование, таблицы
5	Malaria in Special Groups	ПК-15, ОПК-6	Студент оценивает риски; разрабатывает лечение; предлагает профилактику	Ситуационные задачи
6	Leishmaniasis	ПК-15	Студент интерпретирует клинические формы; проводит дифференциальную диагностику	Устный опрос
7	Rickettsiosis	ПК-15	Студент анализирует клинические случаи; предлагает лечение	Ситуационные задачи
8	Trypanosomiasis	ПК-15	Студент объясняет патогенез; интерпретирует симптомы; формирует план лечения	Реферат, тест
9	Filariasis	ПК-15	Студент анализирует хронические формы; предлагает профилактику и контроль	Презентация

Паспорт фонда оценочных средств по дисциплине «Тропические инфекции»

№	Наименование темы	Компетенции	Планируемые результаты обучения дисциплины	Оценочные средства
1	Introduction to Tropical Medicine. Amoebiasis	ПК-15	• Раскрывает медико-географическое понятие тропиков • Объясняет влияние факторов среды на здоровье • Описывает этиологию, патогенез, клинику амебиаза • Обосновывает методы диагностики и лечения	Устный опрос, тест
2	Hemorrhagic Viral Fevers (Dengue, Ebola, Marburg, CCHF, Hanta)	ПК-15	• Классифицирует геморрагические лихорадки • Объясняет пути передачи и патогенез • Анализирует клиническую картину • Составляет план лечения и профилактики	Ситуационные задачи, тест
3	Hemorrhagic Fever with Renal Syndrome	ПК-15	• Описывает этиологию и эпидемиологию • Демонстрирует патогенез • Анализирует клинику и осложнения • Обосновывает лечение и профилактику	Устный опрос, реферат
4	Malaria	ПК-15	• Объясняет жизненный цикл плазмодия • Классифицирует формы малярии • Интерпретирует клиническую картину • Составляет диагностический алгоритм	Тест, устный опрос
5	Malaria in Children and Pregnant Women	ПК-15, ОПК-6	• Анализирует особенности течения малярии • Объясняет патогенез у уязвимых групп • Разрабатывает план лечения по рекомендациям WHO • Обосновывает профилактику	Презентация, тест
6	Leishmaniasis and Japanese Encephalitis	ПК-15	• Описывает этиологию и патогенез • Сравнивает клинические формы • Разрабатывает схемы	Устный опрос, ситуационные задачи

			лечения • Предлагает профилактические меры	
7	Rickettsiosis and Japanese Encephalitis	ПК-15	• Анализирует эпидемиологию • Объясняет нейропатогенез • Интерпретирует клинику • Разрабатывает лечебную тактику	Тест, реферат
8	Trypanosomiasis and Nematodes	ПК-15	• Описывает этиологию и классификацию • Объясняет патогенез • Интерпретирует клинические проявления • Обосновывает лечение	Устный опрос, таблицы
9	Filariasis, Cestodes, Trematodes	ПК-15	• Объясняет патогенез филяриоза • Анализирует клинические формы • Разрабатывает терапию • Обосновывает меры контроля	Презентация, тест

Topic: Introduction to Tropical Medicine. Amoebiasis: Etiology, Epidemiology, Pathogenesis, Diagnosis, Treatment, Prevention

МЕТОД: Team-Based Learning (TBL)

Курс: 4 Семестр: 8

Составил(а): к.м.н. Абдимомунова Б.Т.

ЦЕЛЬ ЗАНЯТИЯ / AIM

To introduce students to the concept of tropical medicine, medico-geographical classification of tropical infections, and to develop comprehensive knowledge of amoebiasis — its etiology, epidemiology, pathogenesis, clinical manifestations, complications, diagnosis, treatment, and prevention — through structured teamwork and peer accountability.

TEACHING TOOLS

Section	Equipment / Tools	Purpose
Visual materials	PowerPoint slides (world map of tropical disease distribution, Entamoeba life cycle), WHO burden infographics	Visualize global epidemiology and parasite biology
Laboratory tools	Microscopy slides (E. histolytica trophozoites/cysts), PCR/ELISA demo reports, stool exam photos	Demonstrate diagnostic methods
Clinical cases	TBL team case packets: patient with bloody diarrhea + travel to tropics, liver abscess scenario	Structured team problem-solving
Interactive tools	Readiness Assurance Tests (iRAT/tRAT printed sheets), Kahoot! for iRAT phase, team answer cards	Ensure individual & team accountability
Simulation	Abdominal palpation phantom (hepatomegaly detection), ultrasound image cards (liver abscess)	Practice physical examination skills
Reference materials	Manson's Tropical Diseases, WHO guidelines, CDC Amoebiasis fact sheet	Evidence-based reference
Assessment tools	iRAT/tRAT score sheets, case discussion rubrics, peer evaluation forms	Multidimensional assessment

ASSESSMENT CRITERIA

Вид контроля	Type of Assessment	Критерии / Criteria	Макс. балл
iRAT (Individual Readiness)	Individual Readiness Assurance Test	10 MCQ × 1 point; tests pre-class preparation	10
tRAT (Team Readiness)	Team Readiness Assurance Test	Team consensus on same 10 MCQs; immediate feedback with scratch cards	10
Application Exercise	Team Application Task	Correct clinical reasoning, differential diagnosis, management plan (quality & teamwork)	15

Peer Evaluation	Peer Assessment	Each student rates teammates (preparation, participation, collaboration)	5

TBL TEACHING PLAN (90 MIN)

Время (min)	Тема / Stage	Содержание / Activity	Метод	Результат
0–10	**Phase 1: iRAT**	Each student individually answers 10 MCQs on tropical medicine basics + amoebiasis (pre-class material)	Individual Readiness Test (iRAT)	Establishes individual accountability (10 p)
10–20	**Phase 2: tRAT**	Same 10 questions solved as a team using scratch-cards; immediate feedback loop	Team Readiness Test (tRAT) with IF-AT cards	Team builds consensus, debates answers (10 p)
20–35	**Clarification Mini-Lecture**	Instructor addresses top 2–3 contested questions; covers key concepts (life cycle, pathogenesis map)	Mini-lecture, visual aids	Students resolve misconceptions
35–70	**Phase 3: Application Exercises (2 cases)**	Case A: 35-yr patient from Bangladesh, 14 days bloody diarrhea, liver tenderness. Case B: outbreak in refugee camp — 12 cases, water contamination. Teams present differential diagnosis, investigations, treatment plan + control measures	Case-Based Team Discussion, simultaneous team report-out	Apply theory to practice; propose management plans (15 p)
70–80	**Gallery Walk**	Each team posts answer on whiteboard; class reviews and critiques other teams' answers	Gallery walk, peer critique	Critical evaluation of peers' reasoning
80–90	**Debrief & Peer Eval**	Instructor-led debrief of key learning points; students complete peer evaluation forms	Structured debrief, peer assessment	Consolidation + feedback (5 p)

PLAN-OUTLINE (КОНСПЕКТ)

1. Introduction to Tropical Medicine

Tropical medicine addresses diseases primarily occurring in tropical/subtropical regions. Key drivers: hot climate, humid environment, vector ecology, poor sanitation, and poverty. Medico-geographical zones: sub-Saharan Africa, South/Southeast Asia, Latin America. Classification: viral (dengue, yellow fever), parasitic (malaria, leishmaniasis, amoebiasis), bacterial, helminthic.

2. Amoebiasis — Etiology

Causative agent: Entamoeba histolytica (pathogenic) — differentiated from E. dispar (non-pathogenic) by PCR/isoenzyme analysis. Forms: cyst (infective, environmental survival), trophozoite (invasive, tissue

destruction). Genome encodes cysteine proteases, Gal/GalNAc lectin, and amoebapores — key virulence factors.

3. Epidemiology

~50 million cases/year worldwide; 100,000 deaths (WHO). Endemic: India, Mexico, Bangladesh, tropical Africa. Transmission: fecal-oral — contaminated water, food, hands. Risk groups: travelers, immunocompromised, men who have sex with men. Cysts survive weeks in moist environments.

4. Pathogenesis

Ingested cysts → excystation in small intestine → trophozoites colonize colon → Gal/GalNAc lectin adhesion to mucosa → cysteine proteases degrade ECM → invasive amoebiasis → flask-shaped ulcers in cecum/ascending colon → hematogenous spread → liver (abscess), rarely lung/brain.

5. Clinical Manifestations

Intestinal: 90% asymptomatic colonization. Symptomatic: gradual onset, crampy abdominal pain, bloody-mucous diarrhea (amoebic dysentery), tenesmus, low-grade fever. Fulminant colitis: high mortality, risk of perforation/toxic megacolon. Extraintestinal: Amoebic liver abscess (ALA) — most common; right lobe, single, fever + RUQ pain + hepatomegaly; rarely ruptures into pleura/pericardium.

6. Diagnosis

Method	Finding	Notes
Stool microscopy	Trophozoites with ingested RBCs, cysts	3 samples; limited sensitivity for invasive disease
Stool antigen (ELISA)	E. histolytica-specific antigen	Distinguishes from E. dispar; recommended
Serology (IHA/ELISA)	Anti-amoeba IgG (+) in >90% ALA	Useful in extraintestinal disease
PCR	Species-specific DNA	Gold standard for speciation
Ultrasound / CT	Liver abscess (hypoechoic, single, R lobe)	For extraintestinal amoebiasis

7. Treatment

Tissue amoebicide: Metronidazole 750 mg TID × 7–10 days (DOC) — treats invasive disease. Always follow with luminal amoebicide: Paromomycin 500 mg TID × 7 days or Diloxanide furoate 500 mg TID × 10 days — eradicates cysts. ALA: usually responds to metronidazole alone; therapeutic aspiration if >5 cm, no response, or risk of rupture.

8. Prevention

Safe water (boiling, chlorination, filtration), hand hygiene, proper sanitation, food safety. No vaccine available. Travelers: chemoprophylaxis not recommended; behavioral precautions.

TBL APPLICATION CASES

Case A — Intestinal Amoebiasis

A 35-year-old aid worker returns from Bangladesh after 3 months. 14-day history of progressive, crampy lower abdominal pain with bloody-mucous stools 8–10×/day. Temperature 37.8°C. On exam: tender lower abdomen, no peritonism. CBC: mild leukocytosis. Stool microscopy: trophozoites with ingested RBC.

Team Tasks: (1) Formulate working diagnosis + differential (amoebic vs. bacillary dysentery, IBD). (2) Prioritize investigations. (3) Write treatment plan including luminal clearance. (4) Outline public health measures.

Case B — Amoebic Liver Abscess

A 45-year-old male presents with 10-day fever (39.5°C), right upper quadrant pain radiating to right shoulder, malaise, and weight loss. History of travel to India. No diarrhea. Liver is enlarged and tender. USS: 8×7 cm single hypoechoic lesion in right liver lobe. WBC 14,000. Serology: anti-amoeba IgG positive.

Team Tasks: (1) Diagnosis with justification. (2) Investigations to exclude pyogenic abscess. (3) Treatment plan + indications for aspiration. (4) Complications if untreated.

IRAT / TRAT MCQ QUESTIONS

- 1. Which form of Entamoeba histolytica is infective to humans? (a) Trophozoite (b) Cyst ✓ (c) Sporozoite (d) Merozoite
- 2. The gold standard for distinguishing E. histolytica from E. dispar is: (a) Stool microscopy (b) Serology (c) PCR ✓ (d) Ultrasound
- 3. The most common site of extraintestinal amoebiasis is: (a) Brain (b) Lung (c) Liver ✓ (d) Spleen
- 4. First-line treatment for invasive intestinal amoebiasis is: (a) Chloroquine (b) Metronidazole ✓ (c) Paromomycin alone (d) Tetracycline
- 5. Flask-shaped ulcers in the colon are characteristic of: (a) Shigellosis (b) Crohn's disease (c) Amoebiasis ✓ (d) Tuberculosis
- 6. Luminal amoebicide is given after metronidazole to: (a) Treat liver abscess (b) Eradicate intestinal cysts ✓ (c) Cover bacterial superinfection (d) Prevent relapse of liver abscess
- 7. Which virulence factor of E. histolytica destroys the extracellular matrix? (a) Gal/GalNAc lectin (b) Amoebapores (c) Cysteine proteases ✓ (d) Exotoxins
- 8. Amoebic liver abscess typically appears on ultrasound as: (a) Hyperechoic multiple lesions (b) Single hypoechoic right-lobe lesion ✓ (c) Calcified lesion (d) Bilateral lesions
- 9. Which preventive strategy is most important for amoebiasis? (a) Vaccination (b) Safe water and hand hygiene ✓ (c) Chemoprophylaxis (d) Antibiotic prophylaxis
- 10. Amoebic dysentery differs from bacillary dysentery in that it: (a) Always has high fever (b) Has more systemic symptoms (c) Has gradual onset and fewer systemic signs ✓ (d) Is caused by Shigella

REFERENCES

№	Source	Type	Content / Use	Year
1	Farrar J et al. Manson's Tropical Diseases, 23rd ed.	Textbook	Comprehensive tropical medicine reference	2019
2	WHO. Amoebiasis (Resolution WHA50.29)	WHO guideline	Global burden, diagnosis, treatment	2023
3	Stanley SL. Amoebiasis. Lancet	Review article	Pathogenesis, immunity, management	2020
4	CDC. Amebiasis Fact Sheet	CDC guideline	Epidemiology, treatment, prevention	2023
5	Harrison's Principles of Internal Medicine, 21st ed.	Textbook	Clinical management	2022

Topic: Hemorrhagic Viral Fevers: Dengue, Marburg, Ebola, Crimea-Congo, Hanta. Etiology, Epidemiology, Pathogenesis, Clinic, Diagnosis, Treatment, Prevention

МЕТОД: Case-Based Learning (CBL) + Role Play «Doctor–Patient–Epidemiologist»

Курс: 4 Семестр: 8

Составил(а): к.м.н. Абдимомунова Б.Т.

Practical Lesson № 2

Topic: Hemorrhagic Viral Fevers: Dengue, Marburg, Ebola, Crimea-Congo, Hanta. Etiology, Epidemiology, Pathogenesis, Clinic, Diagnosis, Treatment, Prevention

ЦЕЛЬ ЗАНЯТИЯ / AIM

To develop students' ability to clinically recognize, differentiate, and manage major viral hemorrhagic fevers (VHF) through immersive case-based analysis and role-play simulation, with emphasis on biosafety, differential diagnosis, and outbreak response within the One Health framework.

TEACHING TOOLS

Section	Equipment / Tools	Purpose
Visual materials	PowerPoint: VHF world map, hemorrhagic pathogenesis animation, PPE levels infographic	Visualize distribution and vascular injury mechanisms
Role Play materials	Patient cards, doctor role cards, epidemiologist scenario, WHO outbreak response checklist	Simulate real clinical/public health encounters
Lab tools	Demo: viral isolation BSL-4 photos, PCR/ELISA report cards (dengue NS1, CCHF IgM), coagulation panel (PT/aPTT/fibrinogen)	Interpret lab data in hemorrhagic context
Clinical cases	CBL packets: 3 cases (dengue, CCHF, Ebola) with staged information release	Progressive case disclosure builds clinical reasoning
Simulation	PPE donning/doffing practice kit, hemorrhage severity scoring card	Practice infection control and severity assessment
Interactive tools	Comparative VHF table worksheet (blank for students to fill), Quizizz differential diagnosis game	Active recall and comparison
Assessment tools	Role-play evaluation rubric, case analysis scoring sheet, MCQ post-test	Comprehensive performance assessment

ASSESSMENT CRITERIA

Вид контроля	Type of Assessment	Критерии / Criteria	Макс. балл
Устный опрос	Oral questioning	Completeness (4), reasoning (3), medical terminology (3)	10
CBL (Case Analysis)	Case-Based Learning	Correct diagnosis + differential (5), management plan (5), outbreak response (5)	15
Role Play	Doctor–Patient–Epidemiologist	History taking (3), clinical reasoning (3), biosafety measures (2), communication (2)	10

MCQ Post-test	Multiple Choice Questions	15 questions × 1 point	15

TEACHING PLAN (90 MIN)

Время (min)	Тема / Stage	Содержание / Activity	Метод	Результат
0–10	**Introduction + Brainstorm**	Brainstorm: What features unite all VHF? Map knowledge of hemorrhagic fevers	Brainstorming, mind activation	Students list hemorrhagic features, fever patterns
10–30	**Comparative Lecture**	Etiology, epidemiology, pathogenesis comparison: Dengue vs. CCHF vs. Ebola vs. Marburg vs. Hanta. Fill comparative worksheet	Interactive lecture, worksheet completion	Students complete VHF comparison table
30–55	**CBL Case Work (3 cases, groups)**	Case 1 (Dengue): tourist from Thailand, fever+rash+thrombocytopenia. Case 2 (CCHF): farmer from Kyrgyzstan, tick bite, hemorrhagic manifestations. Case 3 (Ebola): healthcare worker returning from DRC, with contact history. Staged disclosure: symptoms → labs → epidemiology	Progressive case disclosure, CBL	Apply theory; propose diagnosis, investigations, isolation measures
55–75	**Role Play**	Groups rotate roles: Doctor (history + management), Patient (reads card), Epidemiologist (outbreak investigation). 20 min with feedback	Role play simulation	Practice clinical interview + outbreak response skills
75–85	**Debrief + VHF Differentiation Table**	Teacher summarizes key distinguishing features. Class completes comparison table together	Guided discussion	Consolidate differential diagnostic skills
85–90	**MCQ Post-test**	15 rapid questions covering all 5 VHF entities	Individual test	Knowledge consolidation (15 p)

COMPARATIVE VHF TABLE (PLAN-OUTLINE)

Feature	Dengue	CCHF	Ebola/Marburg	Hantavirus	Yellow Fever
Virus family	Flaviviridae	Nairoviridae	Filoviridae	Hantaviridae	Flaviviridae
Vector/source	Aedes mosquito	Hyalomma tick / livestock	Fruit bats / direct contact	Rodents (no arthropod)	Aedes mosquito

Geographic focus	Tropical Americas, SE Asia	Central Asia, Africa, Middle East	Sub-Saharan Africa	Americas, Asia, Europe	Africa, Americas
Incubation	4–10 days	1–13 days	2–21 days	2–4 weeks (renal)	3–6 days
Key clinical	Breakbone fever, rash, plasma leak	Tick bite → hemorrhage, hepatitis	Massive hemorrhage, organ failure, contagious	Hemorrhagic fever + renal failure	Jaundice + hemorrhage + renal failure
Diagnosis	NS1 Ag, IgM, PCR	PCR, ELISA IgM (BSL-3)	PCR, ELISA (BSL-4)	ELISA IgM/IgG, PCR	PCR, IgM ELISA
Treatment	Supportive; no specific antiviral	Ribavirin (IV/oral)	Supportive; experimental mAbs (Ebola)	Supportive; ribavirin (HFRS)	Supportive; vaccine prophylaxis
Vaccine	Dengvaxia (limited)	None	rVSV-ZEBOV (Ervebo) for Ebola	None	YF-VAX (live attenuated, very effective)

CBL CASE STUDIES

Case 1 – Dengue Hemorrhagic Fever

A 22-year-old female student returns from Thailand after 2 weeks. Day 5: sudden fever 40°C, severe headache, retro-orbital pain, myalgia. Day 3 of fever: petechiae on lower limbs, positive tourniquet test. CBC: Platelets 42,000/μL, WBC 2,800, Hematocrit 48%. Dengue NS1 antigen: positive.

Tasks: (1) Classify dengue severity (WHO 2009). (2) Identify warning signs. (3) Management (IV fluids protocol). (4) When to hospitalize?

Case 2 – Crimean-Congo Hemorrhagic Fever (CCHF)

A 38-year-old sheep farmer from rural Kyrgyzstan presents in June with 4-day history of sudden fever 39°C, severe headache, myalgia, followed by nausea, vomiting, and abdominal pain. Day 5: gingival bleeding, ecchymoses on arms, bloody urine. History of tick found on skin 1 week ago. CBC: PLT 18,000, WBC 1,900, elevated AST/ALT/LDH.

Tasks: (1) Most probable diagnosis + differential. (2) BSL requirements for lab work. (3) Ribavirin dosing + supportive care. (4) Isolation and contact tracing measures. (5) Notification procedure.

Case 3 – Ebola (Role Play Scenario)

A 30-year-old nurse returns from DRC (worked in Ebola treatment center). Day 7 after last patient contact: fever 38.9°C, headache, fatigue, myalgia. Day 9: diarrhea, vomiting. Day 11: maculopapular rash on trunk, internal hemorrhage signs. Ebola PCR: positive.

Role assignments: Doctor: take full history including exposure assessment, initiate isolation protocol. Epidemiologist: conduct outbreak investigation, contact tracing. Patient: follows role card.

REFERENCES

№	Source	Type	Content / Use	Year
1	WHO. Dengue Clinical Management Guidelines	WHO guideline	Dengue severity, management	2023

2	WHO. CCHF Factsheet	WHO factsheet	Epidemiology, treatment with ribavirin	2022
3	WHO. Ebola Virus Disease	WHO guideline	Clinical management, outbreak response	2023
4	Farrar J. Manson's Tropical Diseases, 23rd ed.	Textbook	All VHF chapter	2019
5	CDC. Yellow Book - Viral Hemorrhagic Fevers	CDC guideline	Prevention and management for travelers	2024

Topic: Introduction to Tropical Medicine. Amoebiasis: Etiology, Epidemiology, Pathogenesis, Diagnosis, Treatment, Prevention

МЕТОД: Team-Based Learning (TBL)

Курс: 4 Семестр: 8

Составил(а): к.м.н. Абдимомунова Б.Т.

ЦЕЛЬ ЗАНЯТИЯ / AIM

To introduce students to the concept of tropical medicine, medico-geographical classification of tropical infections, and to develop comprehensive knowledge of amoebiasis — its etiology, epidemiology, pathogenesis, clinical manifestations, complications, diagnosis, treatment, and prevention — through structured teamwork and peer accountability.

TEACHING TOOLS

Section	Equipment / Tools	Purpose
Visual materials	PowerPoint slides (world map of tropical disease distribution, Entamoeba life cycle), WHO burden infographics	Visualize global epidemiology and parasite biology
Laboratory tools	Microscopy slides (E. histolytica trophozoites/cysts), PCR/ELISA demo reports, stool exam photos	Demonstrate diagnostic methods
Clinical cases	TBL team case packets: patient with bloody diarrhea + travel to tropics, liver abscess scenario	Structured team problem-solving
Interactive tools	Readiness Assurance Tests (iRAT/tRAT printed sheets), Kahoot! for iRAT phase, team answer cards	Ensure individual & team accountability
Simulation	Abdominal palpation phantom (hepatomegaly detection), ultrasound image cards (liver abscess)	Practice physical examination skills
Reference materials	Manson's Tropical Diseases, WHO guidelines, CDC Amoebiasis fact sheet	Evidence-based reference
Assessment tools	iRAT/tRAT score sheets, case discussion rubrics, peer evaluation forms	Multidimensional assessment

ASSESSMENT CRITERIA

Вид контроля	Type of Assessment	Критерии / Criteria	Макс. балл
iRAT (Individual Readiness)	Individual Readiness Assurance Test	10 MCQ × 1 point; tests pre-class preparation	10
tRAT (Team Readiness)	Team Readiness Assurance Test	Team consensus on same 10 MCQs; immediate feedback with scratch cards	10
Application Exercise	Team Application Task	Correct clinical reasoning, differential diagnosis, management plan (quality & teamwork)	15

Peer Evaluation	Peer Assessment	Each student rates teammates (preparation, participation, collaboration)	5

TBL TEACHING PLAN (90 MIN)

Время (min)	Тема / Stage	Содержание / Activity	Метод	Результат
0–10	**Phase 1: iRAT**	Each student individually answers 10 MCQs on tropical medicine basics + amoebiasis (pre-class material)	Individual Readiness Test (iRAT)	Establishes individual accountability (10 p)
10–20	**Phase 2: tRAT**	Same 10 questions solved as a team using scratch-cards; immediate feedback loop	Team Readiness Test (tRAT) with IF-AT cards	Team builds consensus, debates answers (10 p)
20–35	**Clarification Mini-Lecture**	Instructor addresses top 2–3 contested questions; covers key concepts (life cycle, pathogenesis map)	Mini-lecture, visual aids	Students resolve misconceptions
35–70	**Phase 3: Application Exercises (2 cases)**	Case A: 35-yr patient from Bangladesh, 14 days bloody diarrhea, liver tenderness. Case B: outbreak in refugee camp — 12 cases, water contamination. Teams present differential diagnosis, investigations, treatment plan + control measures	Case-Based Team Discussion, simultaneous team report-out	Apply theory to practice; propose management plans (15 p)
70–80	**Gallery Walk**	Each team posts answer on whiteboard; class reviews and critiques other teams' answers	Gallery walk, peer critique	Critical evaluation of peers' reasoning
80–90	**Debrief & Peer Eval**	Instructor-led debrief of key learning points; students complete peer evaluation forms	Structured debrief, peer assessment	Consolidation + feedback (5 p)

PLAN-OUTLINE (КОНСПЕКТ)

1. Introduction to Tropical Medicine

Tropical medicine addresses diseases primarily occurring in tropical/subtropical regions. Key drivers: hot climate, humid environment, vector ecology, poor sanitation, and poverty. Medico-geographical zones: sub-Saharan Africa, South/Southeast Asia, Latin America. Classification: viral (dengue, yellow fever), parasitic (malaria, leishmaniasis, amoebiasis), bacterial, helminthic.

2. Amoebiasis — Etiology

Causative agent: Entamoeba histolytica (pathogenic) — differentiated from E. dispar (non-pathogenic) by PCR/isoenzyme analysis. Forms: cyst (infective, environmental survival), trophozoite (invasive, tissue

destruction). Genome encodes cysteine proteases, Gal/GalNAc lectin, and amoebapores — key virulence factors.

3. Epidemiology

~50 million cases/year worldwide; 100,000 deaths (WHO). Endemic: India, Mexico, Bangladesh, tropical Africa. Transmission: fecal-oral — contaminated water, food, hands. Risk groups: travelers, immunocompromised, men who have sex with men. Cysts survive weeks in moist environments.

4. Pathogenesis

Ingested cysts → excystation in small intestine → trophozoites colonize colon → Gal/GalNAc lectin adhesion to mucosa → cysteine proteases degrade ECM → invasive amoebiasis → flask-shaped ulcers in cecum/ascending colon → hematogenous spread → liver (abscess), rarely lung/brain.

5. Clinical Manifestations

Intestinal: 90% asymptomatic colonization. Symptomatic: gradual onset, crampy abdominal pain, bloody-mucous diarrhea (amoebic dysentery), tenesmus, low-grade fever. Fulminant colitis: high mortality, risk of perforation/toxic megacolon. Extraintestinal: Amoebic liver abscess (ALA) — most common; right lobe, single, fever + RUQ pain + hepatomegaly; rarely ruptures into pleura/pericardium.

6. Diagnosis

Method	Finding	Notes
Stool microscopy	Trophozoites with ingested RBCs, cysts	3 samples; limited sensitivity for invasive disease
Stool antigen (ELISA)	E. histolytica-specific antigen	Distinguishes from E. dispar; recommended
Serology (IHA/ELISA)	Anti-amoeba IgG (+) in >90% ALA	Useful in extraintestinal disease
PCR	Species-specific DNA	Gold standard for speciation
Ultrasound / CT	Liver abscess (hypoechoic, single, R lobe)	For extraintestinal amoebiasis

7. Treatment

Tissue amoebicide: Metronidazole 750 mg TID × 7–10 days (DOC) — treats invasive disease. Always follow with luminal amoebicide: Paromomycin 500 mg TID × 7 days or Diloxanide furoate 500 mg TID × 10 days — eradicates cysts. ALA: usually responds to metronidazole alone; therapeutic aspiration if >5 cm, no response, or risk of rupture.

8. Prevention

Safe water (boiling, chlorination, filtration), hand hygiene, proper sanitation, food safety. No vaccine available. Travelers: chemoprophylaxis not recommended; behavioral precautions.

TBL APPLICATION CASES

Case A — Intestinal Amoebiasis

A 35-year-old aid worker returns from Bangladesh after 3 months. 14-day history of progressive, crampy lower abdominal pain with bloody-mucous stools 8–10×/day. Temperature 37.8°C. On exam: tender lower abdomen, no peritonism. CBC: mild leukocytosis. Stool microscopy: trophozoites with ingested RBC.

Team Tasks: (1) Formulate working diagnosis + differential (amoebic vs. bacillary dysentery, IBD). (2) Prioritize investigations. (3) Write treatment plan including luminal clearance. (4) Outline public health measures.

Case B — Amoebic Liver Abscess

A 45-year-old male presents with 10-day fever (39.5°C), right upper quadrant pain radiating to right shoulder, malaise, and weight loss. History of travel to India. No diarrhea. Liver is enlarged and tender. USS: 8×7 cm single hypoechoic lesion in right liver lobe. WBC 14,000. Serology: anti-amoeba IgG positive.

Team Tasks: (1) Diagnosis with justification. (2) Investigations to exclude pyogenic abscess. (3) Treatment plan + indications for aspiration. (4) Complications if untreated.

IRAT / TRAT MCQ QUESTIONS

- 1. Which form of Entamoeba histolytica is infective to humans? (a) Trophozoite (b) Cyst ✓ (c) Sporozoite (d) Merozoite
- 2. The gold standard for distinguishing E. histolytica from E. dispar is: (a) Stool microscopy (b) Serology (c) PCR ✓ (d) Ultrasound
- 3. The most common site of extraintestinal amoebiasis is: (a) Brain (b) Lung (c) Liver ✓ (d) Spleen
- 4. First-line treatment for invasive intestinal amoebiasis is: (a) Chloroquine (b) Metronidazole ✓ (c) Paromomycin alone (d) Tetracycline
- 5. Flask-shaped ulcers in the colon are characteristic of: (a) Shigellosis (b) Crohn's disease (c) Amoebiasis ✓ (d) Tuberculosis
- 6. Luminal amoebicide is given after metronidazole to: (a) Treat liver abscess (b) Eradicate intestinal cysts ✓ (c) Cover bacterial superinfection (d) Prevent relapse of liver abscess
- 7. Which virulence factor of E. histolytica destroys the extracellular matrix? (a) Gal/GalNAc lectin (b) Amoebapores (c) Cysteine proteases ✓ (d) Exotoxins
- 8. Amoebic liver abscess typically appears on ultrasound as: (a) Hyperechoic multiple lesions (b) Single hypoechoic right-lobe lesion ✓ (c) Calcified lesion (d) Bilateral lesions
- 9. Which preventive strategy is most important for amoebiasis? (a) Vaccination (b) Safe water and hand hygiene ✓ (c) Chemoprophylaxis (d) Antibiotic prophylaxis
- 10. Amoebic dysentery differs from bacillary dysentery in that it: (a) Always has high fever (b) Has more systemic symptoms (c) Has gradual onset and fewer systemic signs ✓ (d) Is caused by Shigella

REFERENCES

№	Source	Type	Content / Use	Year
1	Farrar J et al. Manson's Tropical Diseases, 23rd ed.	Textbook	Comprehensive tropical medicine reference	2019
2	WHO. Amoebiasis (Resolution WHA50.29)	WHO guideline	Global burden, diagnosis, treatment	2023
3	Stanley SL. Amoebiasis. Lancet	Review article	Pathogenesis, immunity, management	2020
4	CDC. Amebiasis Fact Sheet	CDC guideline	Epidemiology, treatment, prevention	2023
5	Harrison's Principles of Internal Medicine, 21st ed.	Textbook	Clinical management	2022

Practical Lesson № 3

Topic: Hemorrhagic Fever with Renal Syndrome (HFRS): Etiology, Epidemiology, Pathogenesis, Clinic, Diagnosis, Treatment, Prevention

ЦЕЛЬ ЗАНЯТИЯ / AIM

To develop students' research and analytical skills in studying hantavirus infections causing HFRS, by engaging them in evidence-based investigation of clinical data, building diagnostic algorithms, and interpreting multi-organ pathophysiology including renal, hemorrhagic, and cardiovascular components.

TEACHING TOOLS

Section	Equipment / Tools	Purpose
Visual materials	Hantavirus distribution map, hemorrhagic-renal pathogenesis diagram, photomicrographs of renal tubular injury	Visualize pathophysiological mechanisms
Research materials	Scientific article extracts (Lancet Infect Dis, WHO reports), renal function trend tables from real HFRS cases	RBL primary source analysis
Lab tools	Progressive lab result cards: CBC, renal panel (BUN, creatinine, urine analysis), coagulation tests, hantavirus ELISA IgM/IgG	Sequential lab interpretation simulating disease stages
Algorithm tools	Blank algorithm template sheets, colored markers for mind-map stations	Structured algorithm construction
Clinical cases	Two case packets: mild HFRS and severe HFRS with acute renal failure requiring dialysis	Differential severity assessment
Simulation	Fluid balance charts, urine output monitoring worksheet, hemodialysis indication flowchart	Clinical decision-making practice
Assessment	Article analysis rubric, algorithm evaluation checklist, oral defense scoring form	RBL-specific assessment criteria

ASSESSMENT CRITERIA

Вид контроля	Type of Assessment	Критерии / Criteria	Макс. балл
Устный опрос	Oral questioning	Completeness (4), pathophysiology reasoning (4), terminology (2)	10
RBL – Article Analysis	Research-Based Analysis	Correct interpretation of study findings (5), critical appraisal (5), relevance to case (5)	15
Algorithm Building	Diagnostic/Treatment Algorithm	Logical structure (5), completeness of stages (5), clinical accuracy (5)	15

TEACHING PLAN (90 MIN)

Время (min)	Тема / Stage	Содержание / Activity	Метод	Результат
0–10	**Introduction – RBL Brief**	Explain RBL method. Distribute article extracts on hantavirus epidemiology and HFRS pathophysiology. Set research questions	RBL introduction, Q-setting	Students formulate 3 research questions about HFRS
10–30	**Self-directed Research Phase**	Groups read article extracts, analyze epidemiological tables, extract key data. Teacher circulates for guidance	Guided self-directed research	Students extract facts: incubation, stages, mortality, treatment evidence
30–55	**Theoretical Synthesis**	Group presentations of research findings (3 min each). Teacher fills gaps — pathogenesis diagram: hantavirus + endothelial injury → capillary leak → renal failure	RBL group presentations, mini-lecture	Synthesize theory from research + formal teaching
55–75	**Algorithm Building**	Teams build diagnosis + treatment algorithm for HFRS. Must include: clinical stages (febrile, hypotensive, oliguric, polyuric, convalescent), lab interpretation at each stage, management decisions	Team algorithm construction	Visual algorithm covering 5 HFRS disease stages (15 p)
75–85	**Case Application**	Present 2 HFRS cases (mild vs. severe). Teams apply their algorithm to guide management, including dialysis indications	Case-Based Application	Validate algorithm against real cases
85–90	**Oral Defense + Feedback**	Each team defends 1 key algorithm decision. Teacher provides feedback	Oral defense	Verbal consolidation (10 p)

PLAN-OUTLINE: HFRS

1. Etiology

Hantaviruses (family Hantaviridae, order Bunyavirales). Segmented ssRNA (negative-sense). Key species: Puumala (Europe — HFRS mild), Hantaan (Asia — HFRS severe), Seoul (worldwide — HFRS moderate), Dobrava (Balkans — HFRS severe). HCPS (Hantavirus Cardiopulmonary Syndrome) caused by Sin Nombre (Americas).

2. Epidemiology

~200,000 HFRS cases/year (WHO). Endemic: Russia, China, Korea, Scandinavia, Balkans. Reservoir: specific rodent species (voles, mice, rats) — shed virus in urine, feces, saliva. Transmission: inhalation of infected aerosols, direct rodent contact, rarely person-to-person. Risk groups: rural workers, hikers, military personnel, campers.

3. Pathogenesis

Hantaviruses target β3 integrin on endothelial cells → endothelial dysfunction without direct cytolysis → capillary leak → thrombocytopenia + coagulopathy. Renal: virus replicates in renal tubular cells → massive proteinuria → oliguric renal failure. Immunopathology: exuberant T-cell and cytokine response contributes to vascular damage.

4. Clinical Stages (HFRS)

Stage	Duration	Key Features	Lab Findings
1. Febrile	3–7 days	Sudden fever 39–40°C, headache, myalgia, flushed face, conjunctival injection, petechiae	Leukocytosis, thrombocytopenia, proteinuria begins
2. Hypotensive	1–3 days	BP drop, tachycardia, oliguria, hemorrhagic manifestations	↑Creatinine, ↓Hb, clotting abnormalities
3. Oliguric	3–7 days	Oliguria/anuria (<400 mL/day), edema, hypertension, uremia	Peak creatinine, hyperkalemia, acidosis
4. Polyuric	2–14 days	Diuresis up to 3–8 L/day, risk of dehydration + electrolyte imbalance	Improving creatinine, electrolyte monitoring crucial
5. Convalescent	Weeks–months	Gradual recovery, fatigue, possible hypertension	Normalization of renal function

5. Diagnosis

ELISA IgM/IgG hantavirus (seroconversion): confirmatory. PCR (RNA) in early febrile phase: highest sensitivity. Clinical criteria: hemorrhagic + renal syndrome + rodent exposure epidemiology. Urinalysis: massive proteinuria, hematuria, granular casts.

6. Treatment

Supportive: careful fluid management (avoid overload in oliguric phase), electrolyte correction. Severe HFRS: renal replacement therapy (hemodialysis) for uremia, hyperkalemia, or fluid overload. Antiviral: IV Ribavirin (early febrile phase) has shown benefit in severe Hantaan cases (Asian HFRS). No specific treatment for HCPS (SNV).

7. Indications for Hemodialysis

Indication	Threshold
Uremia (BUN)	>80 mg/dL with symptoms
Hyperkalemia	>6.5 mEq/L or ECG changes
Metabolic acidosis	pH <7.2
Fluid overload	Pulmonary edema unresponsive to diuretics
Uremic pericarditis	Any occurrence

RESEARCH QUESTIONS FOR RBL PHASE

1. 1. What is the global mortality rate of HFRS by species? What determines severity?
2. 2. What evidence supports ribavirin use in HFRS — which studies, which species?
3. 3. How does HFRS differ from HCPS (Sin Nombre) — clinical, pathogenesis, management?
4. 4. What are the current WHO/CDC surveillance recommendations for hantavirus?
5. 5. What rodent control strategies have shown effectiveness in endemic regions?

REFERENCES

№	Source	Type	Content / Use	Year
1	WHO. Hantavirus Pulmonary Syndrome Factsheet	WHO guideline	Epidemiology, prevention	2023
2	Jonsson CB et al. A Global Perspective on Hantavirus Ecology. Clin Microbiol Rev	Review article	Pathogenesis, treatment evidence	2020
3	Manson's Tropical Diseases, 23rd ed.	Textbook	HFRS and HCPS chapter	2019
4	CDC. Hantavirus — Information for Clinicians	CDC resource	Diagnosis, management, prevention	2023
5	Rasmuson J et al. Ribavirin treatment of HFRS. N Engl J Med	Clinical trial	Ribavirin efficacy evidence	2020

Practical Lesson № 4

Topic: Malaria (P.vivax, P.falciparum, P.ovale, P.malariae): Etiology, Epidemiology, Pathogenesis, Clinical Manifestations, Complications, Diagnosis, Treatment, Prevention

ЦЕЛЬ ЗАНЯТИЯ / AIM

To develop comprehensive clinical and epidemiological competencies in malaria — the most important parasitic disease globally — through problem-based learning with authentic clinical scenarios, emphasizing recognition of severe malaria, rational treatment selection, and global prevention strategies.

TEACHING TOOLS

Section	Equipment / Tools	Purpose
Visual materials	Plasmodium life cycle animation, thick and thin blood film photos (all 4 species morphology), WHO malaria severity criteria poster	Visualize complex life cycle and diagnostic morphology
Laboratory tools	Giemsa-stained slide demonstration (ring forms, schizonts, gametocytes), RDT (HRP2/pLDH) test card demo, G6PD test results	Practice real diagnostic methods
Clinical cases	PBL packets: 4 cases (uncomplicated P.vivax, severe P.falciparum with cerebral malaria, malaria in pregnancy, mixed infection)	Authentic problem scenarios for PBL groups
Simulation	Malaria severity scoring checklist (WHO criteria), lumbar puncture decision algorithm, ACT/IV quinine dosing worksheet	Treatment decision-making simulation
Interactive tools	Malaria treatment algorithm flowchart (blank for student completion), microscopy matching game	Active recall + skill application
Reference materials	WHO Guidelines for Malaria 2023, Harrison's Infectious Diseases chapter, Manson's Tropical Diseases	Evidence base for PBL research phase
Assessment	PBL group process rubric, case report scoring, MCQ on malaria species differentiation	Holistic PBL assessment

ASSESSMENT CRITERIA

Вид контроля	Type of Assessment	Критерии / Criteria	Макс. балл
PBL Group Process	PBL Group Work	Problem identification (5), hypothesis generation (5), research & synthesis (5), solution quality (5), teamwork (5)	25
Практические навыки	Practical Skills	Blood film interpretation (5), species identification (5), treatment plan (5), prevention counseling (5)	20

MCQ Post-test	Multiple Choice Test	20 questions × 1 point	20

PBL TEACHING PLAN (90 MIN)

Время (min)	Тема / Stage	Содержание / Activity	Метод	Результат
0–5	**Step 1: Problem Presentation**	Present PBL trigger: 'A 28-year-old traveler from sub-Saharan Africa arrives febrile, confused, with jaundice and dark urine. What do you need to know?'	Trigger case presentation	Students identify information gaps
5–20	**Step 2: Problem Analysis**	Groups identify key clinical problems, generate differential diagnoses, list what they already know about malaria	Brainstorm, KWL chart (Know-Want-Learned)	Systematic problem analysis
20–35	**Step 3: Learning Goals**	Groups define specific learning objectives: life cycle, species differences, severe malaria criteria, treatment protocols	Self-directed goal setting	Students own their learning agenda
35–60	**Step 4: Self-Directed Research**	Groups research learning objectives using provided resource materials (WHO guidelines, textbook extracts). Each member covers specific subtopic	Self-directed research with resource packets	Builds individual expertise for team synthesis
60–80	**Step 5: Synthesis & Case Resolution**	Groups present findings, resolve the trigger case, present management plan. Other groups critique	Team teaching, peer critique	Integration of knowledge + critical evaluation (25 p)
80–90	**Step 6: Reflection + MCQ**	Teacher consolidation of key points. Malaria-specific MCQ post-test (10 questions)	Reflection, individual test	Self-assessment + consolidation (20 p)

PLAN-OUTLINE: MALARIA

1. Life Cycle

Sexual cycle (sporogony) in Anopheles mosquito: gametocytes → zygote → ookinete → oocyst → sporozoites. Asexual cycle (schizogony) in humans: hepatic (pre-erythrocytic) schizogony → merozoites → erythrocytic schizogony → rings → trophozoites → schizonts → merozoites (+gametocytes). P.vivax/ovale: dormant hypnozoites in liver → relapses.

2. Species Comparison

Feature	P.falciparum	P.vivax	P.ovale	P.malariae	P.knowlesi

Fever pattern	Irregular	48h (tertian)	48h (tertian)	72h (quartan)	24h
RBC infected	All ages	Reticulocytes	Reticulocytes	Older RBC	All
Hypnozoites	No	Yes	Yes	No	No
Severity	HIGH – cerebral malaria	Low	Low	Low	Moderate
Treatment	ACT ± IV artesunate	ACT + primaquine	ACT + primaquine	Chloroquine	ACT

3. Severe Malaria (WHO Criteria — P.falciparum)

Any of: impaired consciousness/coma, severe anemia (Hb<7g/dL), respiratory distress, hyperparasitemia (>5% infected RBC), renal failure (creatinine >3mg/dL), hypoglycemia (<2.2mmol/L), circulatory collapse, pulmonary edema, abnormal bleeding, hyperuricemia, jaundice + organ impairment.

4. Pathogenesis of Severe Malaria

Cytoadherence: P.falciparum-infected RBC express PfEMP1 → bind endothelium of cerebral vessels → sequestration → cerebral malaria. Rosetting: infected RBC + uninfected RBC clumping → microvascular obstruction. Cytokine storm: TNF, IL-1, IL-6 → fever + metabolic derangements. Hemolysis: hemoglobinuria → 'blackwater fever'.

5. Diagnosis

Thick blood film (gold standard): sensitivity 97% if done correctly; counts parasitemia. Thin blood film: species morphology identification. RDT (HRP2 for P.falciparum, pLDH for all species): rapid, field use, <20 min. PCR: species confirmation, drug resistance genotyping. G6PD test: before primaquine (hemolysis risk).

6. Treatment (WHO 2023)

Uncomplicated P.falciparum: Artemether-Lumefantrine (AL) or Artesunate-Amodiaquine (ASAQ) × 3 days. Severe malaria: IV/IM Artesunate × minimum 24h → oral ACT when tolerated. P.vivax/ovale: CQ (if sensitive) + Primaquine 0.25mg/kg/day × 14 days (radical cure, check G6PD). Malaria in pregnancy: AL in 2nd/3rd trimester; avoid primaquine.

7. PBL Trigger Case — Severe P.falciparum Malaria

28-year-old male, returned 5 days ago from Tanzania. Fever 40°C × 4 days, now confused, GCS 11. Jaundice+. Dark urine. Hb 6.2g/dL. Platelets 45,000. Creatinine 2.9 mg/dL. RDT: P.falciparum positive. Blood film: 8% parasitemia, multiple ring forms per RBC.

PBL Tasks: (1) Define exact severity criteria met. (2) Immediate management (route, drug, dose). (3) Monitoring parameters. (4) When to switch to oral therapy. (5) What complications to anticipate? (6) Contact and prevention counseling for family.

REFERENCES

№	Source	Type	Content / Use	Year
1	WHO. Guidelines for Malaria. 2023	WHO guideline	Treatment, severity, prevention	2023
2	WHO. World Malaria Report	WHO annual report	Global epidemiology, burden	2023
3	Harrison's Principles of Internal Medicine, 21st ed.	Textbook	Clinical management	2022

4	Manson's Tropical Diseases, 23rd ed.	Textbook	Comprehensive malaria chapter	2018
5	CDC Malaria — Diagnosis and Treatment in the US	CDC guideline	Practical guidance, drug options	2024

Practical Lesson № 5

Topic: Malaria in Children and Pregnant Women: Pathogenesis, Clinical Features, Complications, Treatment, Prevention

ЦЕЛЬ ЗАНЯТИЯ / AIM

To develop students' ability to recognize, assess, and manage malaria in vulnerable populations — children and pregnant women — through standardized patient simulations and OSCE stations, emphasizing severity assessment, treatment modifications, and preventive counseling specific to these groups.

TEACHING TOOLS

Section	Equipment / Tools	Purpose
OSCE stations	Station 1: Pediatric malaria assessment (history + exam on mannequin); Station 2: Pregnant woman with malaria (counseling + treatment planning); Station 3: Lab interpretation (blood film + RDT + CBC in pregnancy)	Structured clinical skills assessment
Simulation tools	Pediatric vital signs cards, obstetric history template, fetal assessment checklist, Ballard gestational age chart	Simulate realistic clinical encounter
Visual materials	Placental malaria histology, pediatric severity scoring chart (modified Blantyre coma scale), maternal malaria mortality pyramid	Visualize unique pathophysiology
Case materials	4 standardized patient scripts: P.falciparum in 2-yr-old, severe neonatal malaria, P.vivax in 3rd trimester, malaria in HIV+ pregnant woman	Clinical diversity exposure
Reference materials	WHO Guidelines for Malaria 2023, UNICEF IMCI malaria module, WHO antenatal care guidelines	Evidence-based practice
Assessment	OSCE checklists per station, OSCE global rating scales, formative feedback cards	Standardized OSCE assessment

OSCE ASSESSMENT STRUCTURE

OSCE Station	Skills Assessed	Format	Points
Station 1: Pediatric History & Exam	Pediatric malaria history, modified Blantyre score, severity assessment	8 min with standardized patient card	15
Station 2: Antenatal Malaria Counseling	Safe drug selection in pregnancy, ITN counseling, IPTp protocol	8 min counseling scenario	15
Station 3: Lab Data Interpretation	Blood film species ID, CBC in pregnancy, RDT interpretation, treatment dose calculation	10 min written station	20

TEACHING PLAN (90 MIN)

Время (min)	Тема / Stage	Содержание / Activity	Метод	Результат
0–15	**Pre-OSCE Mini-Briefing**	Key differences in malaria presentation: children vs. adults vs. pregnant. Modified Blantyre scale. IPTp protocol. Drug contraindications in pregnancy	Brief interactive lecture	Students ready for OSCE stations
15–55	**OSCE Rotations (3 stations × ~13 min each)**	Each student/pair rotates through 3 stations. Examiner observes with checklist. Immediate brief feedback after each station	OSCE (standardized patient simulation)	Clinical skills assessment (50 p)
55–70	**Case-Based Debrief**	Teacher presents 2 difficult cases (severe malaria in infant, treatment dilemma in 1st trimester). Class discusses management	Facilitated case discussion	Critical reasoning for complex presentations
70–85	**Treatment Planning Workshop**	Groups design treatment + prevention plan for: (a) 18-month child 12kg with severe P.falciparum; (b) 28-week pregnant woman with P.vivax	Team-based drug dosing calculation	Safe dosing competency
85–90	**Reflection + Q&A**	Students articulate one clinical insight from OSCE experience. Q&A	Structured reflection	Metacognitive consolidation

PLAN-OUTLINE

Malaria in Children — Key Differences

Higher parasite multiplication rates, immature immune response. Severe manifestations more common: cerebral malaria (onset rapid, seizures prominent), severe anemia, respiratory distress, hypoglycemia (especially with quinine use). Modified Blantyre Coma Scale for children <5: eye movements (0–2), best motor (0–2), best verbal (0–2) — severe if ≤2.

Treatment in Children

Uncomplicated: weight-based ACT (artemether-lumefantrine by weight band). Severe: IV/IM artesunate preferred (IV quinine if unavailable). Rectal artesunate as pre-referral treatment. Primaquine for vivax: 0.25 mg/kg/day × 14 days; check G6PD first.

Malaria in Pregnancy

Plasmodium falciparum sequestration in placenta via VAR2CSA (binds CSA in intervillous space) → placental malaria → IUGR, preterm birth, low birth weight, maternal anemia. Risk highest in primigravidae. P.vivax: also causes adverse outcomes via anemia.

Management in Pregnancy

1st trimester: Quinine + clindamycin (ACTs only if no alternative). 2nd/3rd trimester: ACT (artemether-lumefantrine first line). Primaquine CONTRAINDICATED in pregnancy. G6PD testing before radical cure post-partum. IPTp (Intermittent Preventive Treatment in Pregnancy): Sulfadoxine-pyrimethamine at each ANC visit (after 1st trimester) in endemic areas.

Prevention

ITN (Insecticide-Treated Nets): free provision in endemic countries for pregnant women and children <5. IRS (Indoor Residual Spraying). IPTp (SP) in sub-Saharan Africa (WHO recommendation). RTS,S/AS01 (Mosquirix): first malaria vaccine — recommended by WHO in 2021 for children in sub-Saharan Africa (4-dose schedule from 5 months).

OSCE STATION CHECKLISTS

Station 1 Checklist: Pediatric Malaria Assessment

Task	Score (0–2)
Introduces and builds rapport appropriately for age	___ / 2
Asks about fever duration, pattern, and onset	___ / 2
Inquires about travel history and malaria prophylaxis	___ / 2
Checks for vomiting, ability to drink, convulsions	___ / 2
Assesses consciousness (Modified Blantyre or AVPU)	___ / 2
Checks for respiratory distress (nasal flaring, grunting, chest indrawing)	___ / 2
Assesses for anemia (pallor of conjunctiva, palms)	___ / 2
Performs abdominal exam (splenomegaly, hepatomegaly)	___ / 2
Interprets RDT result correctly	___ / 2
Classifies malaria severity and states management plan	___ / 2

REFERENCES

№	Source	Type	Content / Use	Year
1	WHO. Guidelines for Malaria 2023	WHO guideline	Treatment in children and pregnancy	2023
2	WHO. Malaria in Pregnancy — Antenatal Care	WHO guideline	IPTp, ITN, clinical management	2023
3	UNICEF. IMCI Distance Learning Course — Malaria Module	UNICEF guideline	Pediatric malaria management	2022
4	Manson's Tropical Diseases, 23rd ed.	Textbook	Pediatric malaria and pregnancy chapters	2019
5	WHO. RTS,S Vaccine Position Paper	WHO position paper	Malaria vaccine recommendations	2022

Practical Lesson № 6

Topic: Leishmaniasis: Visceral, Cutaneous, and Mucocutaneous Forms — Etiology, Epidemiology, Pathogenesis, Clinic, Diagnosis, Treatment, Prevention

ЦЕЛЬ ЗАНЯТИЯ / AIM

Through a flipped classroom approach combined with mind-mapping, students will integrate pre-class learning about leishmaniasis with in-class application, visual concept synthesis, clinical case analysis, and treatment planning for all three major clinical forms of leishmaniasis.

TEACHING TOOLS

Section	Equipment / Tools	Purpose
Flipped classroom materials	Pre-class video links (WHO Leishmania overview, Osmosis Leishmania), reading guide with guiding questions	Pre-class self-directed preparation
Mind-map tools	Large A2 paper sheets + colored markers, blank digital mind-map template (Miro/paper), central node cards: 'Visceral', 'Cutaneous', 'Mucocutaneous'	Central visual synthesis activity
Visual materials	Sandfly lifecycle diagram, skin lesion photo atlas (oriental sore, espundia, kala-azar facies), world distribution map	Visual reference for mind-map building
Laboratory tools	Photo cards: Giemsa-stained bone marrow aspirate (amastigotes), rK39 RDT card, skin biopsy result, PCR demo report	Diagnostic method visualization
Clinical cases	3 cases (one per form): VL with pancytopenia, CL with non-healing ulcer, MCL with nasal destruction	One case per form
Assessment	Mind-map quality rubric, case analysis scoring, pre-class quiz (submitted online)	Multiple assessment formats

ASSESSMENT CRITERIA

Вид контроля	Type of Assessment	Критерии / Criteria	Макс. балл
Pre-class Quiz (Flipped)	Pre-class Assessment	10 online questions submitted before class; tests pre-reading comprehension	10
Mind Map Quality	Visual Concept Map	Coverage of all 3 forms (5), accuracy of connections (5), inclusion of diagnosis+treatment (5), visual clarity (5)	20
Case Analysis	Case-Based Discussion	Correct diagnosis (3), justification (3), treatment plan (4)	10

FLIPPED CLASSROOM + MIND MAP TEACHING PLAN (90 MIN)

Время (min)	Тема / Stage	Содержание / Activity	Метод	Результат
0–10	**Opening Discussion**	Discuss pre-class material: What surprised you? What was most confusing? Survey of key pre-class quiz answers	Socratic discussion, pre-class quiz review	Activate pre-class learning, resolve misconceptions
10–30	**Mind-Map Construction Phase 1**	Teams build mind-map central structure: 3 branches (Visceral, Cutaneous, Mucocutaneous) with etiology, vector, epidemiology, pathogenesis nodes	Team mind-mapping	Visual synthesis of pre-class material
30–50	**Mind-Map Phase 2 — Clinical + Diagnostic Nodes**	Add: clinical features, key diagnostic methods, treatment, and prevention to each branch. Teams use provided photo cards and lab result cards as reference	Mind-map expansion with evidence	Complete clinical content integration
50–70	**Gallery Walk + Case Integration**	Teams post mind-maps. 3 case cards are distributed — each team must use ANOTHER team's mind-map to solve a case, then present findings	Gallery walk + cross-team analysis	Critical evaluation + case application
70–80	**Comparative Summary Table**	Class collaboratively fills in blank VL vs. CL vs. MCL comparison table on whiteboard	Collaborative table completion	Synthesis and comparison
80–90	**Oral Defense + MCQ**	3 students defend one mind-map branch each. 5 rapid-fire MCQ for consolidation	Oral defense, MCQ	Verbal + written consolidation

PLAN-OUTLINE: LEISHMANIASIS

1. Classification

Causative agents: Leishmania spp. (intracellular protozoa, order Kinetoplastida). Vector: Phlebotomus (Old World) and Lutzomyia (New World) sandflies. Three major syndromes: Visceral Leishmaniasis (VL/kala-azar) — L.donovani, L.infantum; Cutaneous Leishmaniasis (CL) — L.major, L.tropica; Mucocutaneous Leishmaniasis (MCL) — L.braziliensis.

2. Visceral Leishmaniasis (Kala-Azar)

Pathogenesis: amastigotes multiply in macrophages of liver, spleen, bone marrow → massive splenomegaly + hepatomegaly + lymphadenopathy + pancytopenia + hypoalbuminemia. Clinical: gradual fever (irregular), massive splenomegaly, wasting, darkening of skin (kala-azar = 'black disease' in Hindi),

concurrent tuberculosis common in immunocompromised. Diagnosis: rK39 RDT (>95% sensitivity in endemic areas), bone marrow/splenic aspirate for amastigotes (gold standard), PCR, ELISA. Treatment: Liposomal Amphotericin B (L-AmB) — WHO preferred; Miltefosine (oral, avoid in pregnancy); SSG (Pentostam) in East Africa. Post-kala-azar dermal leishmaniasis (PKDL): skin papules/nodules after VL treatment.

3. Cutaneous Leishmaniasis (CL)

L.major (rural zoonotic CL): painless papule → ulcer with raised indurated border ('volcano crater sign') → self-healing in 3–18 months leaving scar. L.tropica (urban anthroponotic CL): slower healing. Diagnosis: slit-skin smear (amastigotes), PCR. Treatment: mild/self-limiting — may observe; moderate-severe: intralesional/systemic antimony, miltefosine, thermotherapy.

4. Mucocutaneous Leishmaniasis (MCL/Espundia)

L.braziliensis (Americas): initial skin lesion heals, but years later → hematogenous dissemination to mucosa → destructive nasopharyngeal leishmaniasis — perforation of nasal septum, palate, larynx. Diagnosis: PCR (biopsy), serology (Leishmania IgG high in MCL). Treatment: liposomal AmB or systemic antimony; reconstruction after cure.

5. Prevention

Vector control: insecticides, sandfly nets (fine mesh), IRS. Personal protection: repellents, permethrin-treated clothing. Reservoir control: culling infected dogs (VL), rodent control (CL). No licensed vaccine for humans; CaniLeish available for dogs.

REFERENCES

№	Source	Type	Content / Use	Year
1	WHO. Leishmaniasis Factsheet	WHO guideline	All forms, treatment updates	2023
2	Manson's Tropical Diseases, 23rd ed.	Textbook	Comprehensive leishmaniasis chapter	2019
3	CDC. Leishmaniasis — Epidemiology & Risk	CDC resource	Geographic distribution	2023
4	Alvar J et al. Leishmaniasis worldwide. PLoS ONE	Review	Global burden	2020
5	Harrison's Principles of Internal Medicine, 21st ed.	Textbook	Clinical management	2022

Practical Lesson № 7

Topic: Japanese Encephalitis & Tropical Rickettsioses (Scrub Typhus, Marseille Fever, Rocky Mountain Spotted Fever, Q Fever): Etiology, Pathogenesis, Clinic, Diagnosis, Treatment, Prevention

МЕТОД: Socratic Seminar + Debate Method

ЦЕЛЬ ЗАНЯТИЯ / AIM

To deepen critical thinking about vector-borne encephalitic and rickettsial diseases through Socratic questioning and structured academic debate, encouraging students to synthesize evidence, compare diseases, defend diagnostic reasoning, and evaluate public health prevention priorities.

TEACHING TOOLS

Section	Equipment / Tools	Purpose
Debate materials	Position cards for debate: 'Which is the greater global threat — Japanese Encephalitis or Scrub Typhus?', argument preparation worksheets	Structured argumentation and evidence synthesis
Socratic seminar	Discussion question cards (10 open-ended clinical questions), Socratic seminar seating circle arrangement	Critical inquiry and peer learning
Visual materials	JE virus neuroinvasion diagram, Rickettsia endothelial cell entry mechanism, disease distribution maps	Visualize pathogenesis
Lab tools	CSF analysis interpretation cards (JE: lymphocytic pleocytosis), serology report cards (Weil-Felix, IFA, Scrub typhus IgM)	Lab data interpretation in neurological context
Clinical cases	Case 1: JE in 8-year-old Vietnamese child with encephalitis; Case 2: Scrub typhus in Southeast Asian trekker with eschar + fever + rash	Authentic clinical application
Reference materials	WHO JE Vaccine Position Paper, CDC Rickettsial Diseases, Manson's Tropical Diseases	Evidence base for debate preparation
Assessment	Debate scoring rubric (argument quality, rebuttal, evidence use), Socratic participation grade, post-session written reflection	Multidimensional verbal/analytical assessment

ASSESSMENT CRITERIA

Вид контроля	Type of Assessment	Критерии / Criteria	Макс. балл
Socratic Seminar Participation	Oral Critical Discussion	Quality of questions/responses (5), use of evidence (5), engagement with peers (5)	15

Structured Debate	Academic Debate	Argument clarity (5), evidence quality (5), rebuttal (5), conclusion (5)	20
Written Reflection	Post-session Reflection	Clinical insight, self-assessment, one key learning per disease (5)	5

TEACHING PLAN (90 MIN)

Время (min)	Тема / Stage	Содержание / Activity	Метод	Результат
0–15	**Mini-Lecture + Pathogenesis Overview**	JE: arboviral neuroinvasion, blood-brain barrier crossing. Rickettsioses: endothelial invasion, vasculitis, rash. Comparative overview table of rickettsial diseases	Interactive lecture with Q&A	Students understand pathogenic mechanisms
15–35	**Socratic Seminar**	Students in a circle. Teacher poses 5 open-ended questions (see below). Students respond, build on each other's answers. Teacher uses Socratic probing: 'How do you know?', 'What if...?'	Socratic seminar	Deep critical discourse (15 p)
35–65	**Structured Debate**	Motion: 'In tropical Southeast Asia, preventing Japanese Encephalitis should be prioritized over Scrub Typhus control.' Group A (FOR) vs. Group B (AGAINST). Opening statements (3 min each) → rebuttals (2 min each) → cross-examination (5 min) → closing statements (2 min each)	Academic debate	Argumentation, evidence synthesis (20 p)
65–80	**Case Analysis (Post-Debate)**	Apply debate knowledge: 2 clinical cases. Class reaches consensus on diagnosis and management using evidence cited during debate	Case-based application	Practical application of theoretical debate content
80–90	**Written Reflection + Summary**	Each student writes 3-minute reflection: 'What was the strongest argument I heard today? What would I do differently as a clinician?'	Individual written reflection	Metacognitive consolidation (5 p)

PLAN-OUTLINE

Japanese Encephalitis (JE)

Etiology: JE virus (Flaviviridae, Flavivirus). Vector: Culex tritaeniorhynchus mosquitoes. Reservoir: pigs + wading birds (amplifying hosts); humans dead-end hosts. Endemic: South/Southeast Asia, Pacific (>3

billion at risk). Clinical: most infections asymptomatic or mild febrile illness; 1% develop encephalitis — rapid onset fever, headache, vomiting → altered consciousness, seizures (especially children), Parkinsonian features (tremor, rigidity), flaccid paralysis. CFR: 20–30% of encephalitis cases; 30–50% survivors have neuropsychiatric sequelae. Diagnosis: IgM ELISA in CSF/serum; MRI: bilateral thalamic lesions (pathognomonic). Treatment: supportive only (antivirals unproven); mannitol for cerebral edema. Prevention: JE vaccines (live attenuated SA14-14-2, inactivated IXIARO) — highly effective; mosquito control.

Tropical Rickettsioses — Overview

Disease	Agent	Vector	Endemic area	Key feature
Scrub typhus	Orientia tsutsugamushi	Trombiculid mites (chiggers)	Asia-Pacific	Eschar + maculopapular rash, prominent lymphadenopathy
Marseille fever	R. conorii	Rhipicephalus tick	Med basin, India, Africa	'Tache noire' (eschar), Mediterranean spotted fever
RMSF	R. rickettsii	Dermacentor tick	Americas	Centripetal rash (palms+soles), very high mortality if untreated
Q fever	Coxiella burnetii	Inhaled aerosols (no arthropod)	Worldwide — livestock	Atypical pneumonia, hepatitis, chronic endocarditis

All rickettsioses: Treatment = Doxycycline 100mg BID × 7 days (DOC); children: doxycycline regardless of age for life-threatening disease. Chloramphenicol alternative but inferior. Weil-Felix test: cheap screening but low specificity. IFA (Immunofluorescence Assay): gold standard serology. PCR from eschar biopsy: highest sensitivity early.

SOCRATIC SEMINAR QUESTIONS

6. 1. Why do JE vaccines succeed while malaria vaccines remain elusive — what does this tell us about the biology of these pathogens?
7. 2. If a febrile traveler from Southeast Asia has an eschar — how does this single finding change your entire differential diagnosis?
8. 3. Q fever is technically a rickettsiosis but has no arthropod vector — does this challenge our definition of tropical disease?
9. 4. RMSF has a case fatality rate of >20% without treatment but near 0% with 24h doxycycline — what does this tell us about the importance of empirical treatment?
10. 5. Japanese encephalitis affects predominantly children in endemic areas while adults have immunity — what public health implications does this have for vaccine strategy?

REFERENCES

№	Source	Type	Content / Use	Year
1	WHO. Japanese Encephalitis Vaccine Position Paper	WHO guideline	JE vaccines, epidemiology	2022
2	CDC. Rickettsial Diseases — Clinical Information	CDC resource	Diagnosis, treatment of all rickettsioses	2023
3	Manson's Tropical Diseases, 23rd ed.	Textbook	JE, scrub typhus, rickettsioses	2019
4	Murdoch DR. Scrub typhus. Lancet Infect Dis	Review	Updated clinical management	2020

Practical Lesson № 8

Topic: Trypanosomiasis: African (Sleeping Sickness) and American (Chagas Disease) — Etiology, Epidemiology, Pathogenesis, Clinic, Diagnosis, Treatment, Prevention. Helminthic Nematodes Overview

МЕТОД: Gamification + Interactive Learning Stations

ЦЕЛЬ ЗАНЯТИЯ / AIM

To engage students in active learning of complex parasitic lifecycles and clinical presentations of trypanosomiasis and helminthic nematodes through gamified station-based activities, integrating knowledge, clinical reasoning, and diagnostic skill-building in an interactive format.

TEACHING TOOLS

Section	Equipment / Tools	Purpose
Gamification tools	Kahoot! (30-question live quiz with leaderboard), 'Parasite Detective' card game (match parasite-vector-disease-treatment)	Competitive engagement, instant feedback
Station materials	5 learning stations (3 min each, rotation): (1) Tsetse fly + lifecycle; (2) Clinical card sort; (3) Lab data; (4) Treatment decision; (5) Prevention planning	Multisensory, active learning
Visual materials	African vs. American trypanosomiasis comparison poster, Chagas cardiac complications diagram, HAT staging criteria	Visual integration of complex content
Laboratory tools	Microscopy photo cards: trypomastigotes in blood film, Winterbottom's sign photo, ECG with Chagas cardiomyopathy	Clinical-pathological correlation
Clinical cases	Case A: Tanzanian farmer with progressive sleepiness + lymphadenopathy (HAT-II); Case B: Brazilian migrant with heart failure + mega-esophagus (Chagas chronic)	Clinical application of station knowledge
Assessment	Station completion checklist, Kahoot! score, case analysis rubric	Gamified + case-based assessment

ASSESSMENT CRITERIA

Вид контроля	Type of Assessment	Критерии / Criteria	Макс. балл
Kahoot! Live Quiz	Gamified MCQ	30 questions (trypanosomiasis + nematodes); points based on accuracy + speed	15
Station Activities	Interactive Station Completion	Correctness at each of 5 stations (3 pts each)	15
Case Analysis	Clinical Case	Correct diagnosis + staging (5), treatment + monitoring plan (5), prevention (5)	15

Устный опрос	Oral Questioning	Clarity, reasoning, terminology	10

TEACHING PLAN (90 MIN)

Время (min)	Тема / Stage	Содержание / Activity	Метод	Результат
0–15	**Introduction + Kahoot! Round 1 (15 Q)**	Live Kahoot! quiz on pre-class reading (lifecycles, geography, vectors). Display leaderboard. Brief discussion of top missed questions	Gamified pre-assessment	Activate prior knowledge, create competition
15–45	**Station Rotations (5 stations × 5 min)**	Groups of 4–5 rotate through 5 stations every 5 min with 1 min transition. Each station has specific task (see below)	Interactive station learning	Active multi-mode learning
45–60	**Case Analysis**	Apply station knowledge to 2 extended clinical cases	Case-Based Learning	Integrate station learning (15 p)
60–75	**Kahoot! Round 2 (15 Q — clinical focus)**	Advanced questions: staging criteria, treatment drugs, complications. Compare score improvement vs. Round 1	Second Kahoot! round	Measure learning progression
75–90	**Debrief + Oral Q&A**	Teacher summarizes key differences between HAT and Chagas. Individual oral questions (5 min). Nematodes overview	Consolidation, oral assessment	Oral assessment (10 p)

LEARNING STATION DESCRIPTIONS

Station	Title	Task
1	The Vector	Match Tsetse fly photos with T.b.rhodesiense and T.b.gambiense. Label lifecycle stages on blank diagram. Identify Reduviid bug for Chagas.
2	Clinical Card Sort	Sort 20 symptom cards into: HAT Stage I / HAT Stage II / Chagas Acute / Chagas Chronic. Justify each placement.
3	Lab Detective	Interpret: (a) Blood film with trypomastigotes, (b) CATT test result, (c) CSF with trypanosomes — what stage is this? (d) ECG with RBBB — what disease?
4	Treatment Planner	Given drug list (Pentamidine, Melarsoprol, Eflornithine, Benznidazole, Nifurtimox, NECT protocol) — match drug to: disease, stage, side effect profile. Calculate dose for 70kg adult with HAT-II.

5	Prevention Architect	Design a 1-page community prevention plan for: (a) HAT in rural Tanzania — vector control, surveillance, case detection; (b) Chagas in Bolivia — housing improvement, vector control, blood safety.

PLAN-OUTLINE: TRYPANOSOMIASIS

African Human Trypanosomiasis (HAT) — Sleeping Sickness

Etiology: T.b.gambiense (West/Central Africa, 98% HAT, chronic) and T.b.rhodesiense (East Africa, acute, rapidly fatal). Vector: Glossina spp. (tsetse fly). Pathogenesis: trypomastigotes in blood → evade immunity by VSG (variant surface glycoprotein) antigenic variation → Stage I: hemolymphatic (fever, lymphadenopathy — Winterbottom's sign posterior cervical nodes, headache, anemia). Stage II: CNS invasion → progressive encephalitis, personality change, sleep cycle reversal (sleeping sickness), coma, death. Diagnosis: CATT screening (gambiense), lymph node aspirate/blood film, CSF (cells >5/mm3 + trypanosomes = Stage II). Treatment: Stage I: Pentamidine (gambiense), Suramin (rhodesiense). Stage II: NECT (Nifurtimox-Eflornithine combination) for gambiense; Melarsoprol for rhodesiense (arsenical — encephalopathic reaction risk).

American Trypanosomiasis (Chagas Disease)

Etiology: T.cruzi. Vector: Triatomine bugs (Reduviidae — 'kissing bugs') — defecate near bite wound. Geographic focus: Latin America (~6 million infected). Transmission: vector-borne, blood transfusion, congenital, oral (fruit juice contamination). Acute phase: Romaña's sign (unilateral painless periorbital edema at entry site), chagoma, fever, lymphadenopathy — usually self-resolving. Chronic phase (30%): cardiomyopathy (heart failure, arrhythmia, sudden death), megacolon, megaesophagus. Diagnosis: acute — blood film (trypomastigotes), PCR. Chronic — serology (2 different ELISAs required). Treatment: Benznidazole or Nifurtimox — effective in acute phase; limited in chronic. Prevention: housing improvement (eliminate triatomine habitat), insecticide spraying, blood screening.

Nematode Overview (Dracunculiasis, Enterobiasis, Hookworm, Ascariasis, Strongyloides)

All transmitted via contaminated soil/water or skin penetration except Dracunculus (ingested via copepods in drinking water). Dracunculiasis (Guinea worm): eradication near complete (<10 cases/year). Key prevention: water filtration, vector control. Strongyloides: hyperinfection syndrome in immunocompromised (Ivermectin — DOC). Ascariasis: most common helminth; Albendazole/Mebendazole. Hookworm: iron deficiency anemia; Albendazole.

REFERENCES

№	Source	Type	Content / Use	Year
1	WHO. Trypanosomiasis — Human African. Factsheet	WHO guideline	Epidemiology, staging, treatment (NECT)	2023
2	WHO. Chagas Disease Factsheet	WHO guideline	Epidemiology, diagnosis, treatment	2023
3	Manson's Tropical Diseases, 23rd ed.	Textbook	Trypanosomiasis comprehensive chapter	2019
4	Bern C. Chagas' Disease. N Engl J Med	Review	Clinical features, management	2020
5	CDC. Parasitic Diseases Portal	CDC resource	All parasitic NTDs	2023

Practical Lesson № 9

Topic: Helminthic Zoonoses: Cestodes (Echinococcosis, Taeniasis) & Trematodes (Schistosomiasis, Clonorchiasis, Fasciola). Filariasis (Lymphatic, Loiasis, Onchocerciasis) — Etiology, Pathogenesis, Diagnosis, Treatment, Prevention

МЕТОД: Project-Based Learning (PjBL) — One Health Framework

ЦЕЛЬ ЗАНЯТИЯ / AIM

To apply One Health thinking — integrating human, animal, and environmental health — in understanding and preventing helminthic zoonoses and filariasis, through a project-based approach where teams design evidence-based One Health intervention plans for assigned diseases.

TEACHING TOOLS

Section	Equipment / Tools	Purpose
Project framework	One Health Project brief template, WHO NTD Roadmap 2021–2030 extracts, country-specific epidemiological data sheets	Authentic PjBL context
Visual materials	Echinococcus lifecycle (dog-sheep-human), Schistosoma lifecycle (snail-water-human), Filaria (mosquito-lymphatic tissue), onchocerciasis 'river blindness' infographic	Complex lifecycle visualization
Laboratory tools	Ultrasound image cards (hydatid cyst — waterlily sign), stool microscopy (Schistosoma eggs with spine), blood microfilaria smear, serological test results	Diagnostic skills in helminthic disease
Simulation	WHO MDA (Mass Drug Administration) planning worksheet, DALY calculation exercise, surgical referral criteria for echinococcosis	Public health planning simulation
Clinical cases	Case A: patient with cystic liver lesion from pastoral Central Asia (echinococcosis); Case B: African child with bloody urine (Schistosoma haematobium); Case C: lymphedema in PNG (lymphatic filariasis)	Cross-regional clinical exposure
Assessment	Project presentation rubric, peer evaluation, written proposal scoring, MCQ on helminthic NTDs	PjBL multi-component assessment

ASSESSMENT CRITERIA

Вид контроля	Type of Assessment	Критерии / Criteria	Макс. балл
One Health Project	PjBL Presentation	Disease understanding (5), intervention logic (5), One Health integration (5), evidence base (5), feasibility (5)	25
Case Analysis	Clinical Case Discussion	Diagnosis (5), diagnostics justification (5), treatment + referral (5)	15

MCQ	Multiple Choice Test	20 questions on all helminthic NTDs covered	10

PJBL TEACHING PLAN (90 MIN)

Время (min)	Тема / Stage	Содержание / Activity	Метод	Результат
0–10	**PjBL Launch**	Present One Health problem: 'NTDs affect >1 billion people — most are helminthic. How would YOU eliminate one in 10 years?' Distribute project brief.	PjBL launch, problem framing	Students understand project scope + timeline
10–30	**Content Foundation**	Rapid but comprehensive overview: cestodes, trematodes, filariasis lifecycles + clinical syndromes. Students receive content summary cards	Condensed interactive lecture with summary cards	Foundational knowledge for project work
30–65	**Team Project Development**	Each team assigned disease (echinococcosis, schistosomiasis, lymphatic filariasis, onchocerciasis, or loiasis). Teams design: (a) epidemiological profile, (b) One Health intervention (human + animal + environment), (c) MDA or surgical program, (d) monitoring indicators	Project work with coaching	One Health intervention design (25 p)
65–80	**Project Presentations + Peer Review**	Each team presents 3-min project. Other teams complete peer evaluation form (2 criteria: One Health integration + feasibility)	Team presentations + peer review	Communication skills + peer learning
80–90	**Case Analysis + MCQ**	Apply theory to 3 clinical cases. 10-question rapid MCQ	Case application + MCQ	Clinical integration + knowledge check (25 p)

PLAN-OUTLINE: HELMINTHS + FILARIASIS

CESTODES

Echinococcosis (Cystic: E.granulosus; Alveolar: E.multilocularis). Lifecycle: dogs (definitive host) → eggs → sheep/humans (intermediate hosts) → hydatid cyst in liver/lung/brain. Clinical: asymptomatic for years; growing cyst causes mass effect. Complications: cyst rupture → anaphylaxis + peritoneal seeding. Diagnosis: ultrasound (waterlily sign, Gharbi classification), serology (ELISA, IHA). Treatment: PAIR procedure (Puncture-Aspiration-Injection-Reaspiration) + Albendazole; surgery for complex/inaccessible

cysts. E.multilocularis: no PAIR — surgery + long-term albendazole. Prevention: dog deworming, meat inspection, hand hygiene.

Taeniasis/Cysticercosis: T.solium (pork tapeworm) — humans are accidental intermediate hosts if they ingest eggs → cysticerci in brain (neurocysticercosis = leading cause of acquired epilepsy in developing world), muscle. Diagnosis: MRI (ring-enhancing lesions), serology. Treatment: Albendazole + corticosteroids + antiepileptics (for NCC).

TREMATODES

Schistosomiasis: S.mansoni (intestinal, Africa/Americas), S.haematobium (urogenital, Africa), S.japonicum (Asia). Lifecycle: freshwater snail (Bulinus/Biomphalaria) → cercariae penetrate skin → schistosomula → adult worms in mesenteric/bladder veins → eggs lodge in tissues → granuloma formation → fibrosis. Acute (Katayama fever): fever, urticaria, eosinophilia (immune complex response). Chronic: hepatosplenic fibrosis + portal hypertension (mansoni), hematuria + bladder cancer (haematobium). Diagnosis: stool/urine egg microscopy (species-specific egg morphology), serology, PCR, Kato-Katz technique. Treatment: Praziquantel (single dose 40 mg/kg). Prevention: snail control (molluscicides), MDA, safe water, sanitation.

Clonorchiasis/Fascioliasis: Clonorchis sinensis (fish-borne, Asia) — bile duct infection → cholangitis → cholangiocarcinoma. Fasciola hepatica/gigantica (livestock-borne, via watercress) — acute hepatic phase (fever + eosinophilia + RUQ pain) → chronic biliary disease. Diagnosis: stool microscopy (eggs), ELISA, ERCP (Fasciola). Treatment: Praziquantel (Clonorchis); Triclabendazole (Fasciola).

FILARIASIS

Disease	Agent	Vector	Tissue target	Key feature	Treatment
Lymphatic filariasis	W.bancrofti, B.malayi	Culex mosquito	Lymphatics	Lymphedema, hydrocele, elephantiasis	DEC + Albendazole or Ivermectin + Albendazole (MDA)
Onchocerciasis	O.volvulus	Simulium blackfly	Skin, eyes	Subcutaneous nodules, 'river blindness'	Ivermectin (MDA annually)
Loiasis	L.loa	Chrysops fly	Subcutaneous	Calabar swellings, eye worm	DEC; caution if high microfilaraemia

One Health in NTD Control

Echinococcosis: dog vaccination + deworming (Praziquantel) + livestock vaccination (EG95 vaccine). Schistosomiasis: snail habitat modification + agricultural land-use change. LF: mosquito control programs + water/sanitation. WHO NTD Roadmap 2030: targets elimination of LF and onchocerciasis as public health problems; MDA programs. GPELF (Global Programme to Eliminate Lymphatic Filariasis): ~8 billion treatments delivered (2000–2020); 600 million people no longer at risk.

ONE HEALTH PROJECT BRIEF TEMPLATE

Component	Your Team's Content
Disease + Etiology	_____
Geographic Focus + Burden (DALYs/cases)	_____
Animal reservoir / environmental factor	_____
Human clinical profile (acute + chronic)	_____
Diagnostic algorithm	_____
Medical treatment (drug + dosing + MDA program)	_____
Veterinary/environmental One Health intervention	_____

Monitoring indicators (Year 1, Year 5, Year 10)	_____
Major obstacles + how to address them	_____
Cost-effectiveness note (reference a study or estimate)	_____

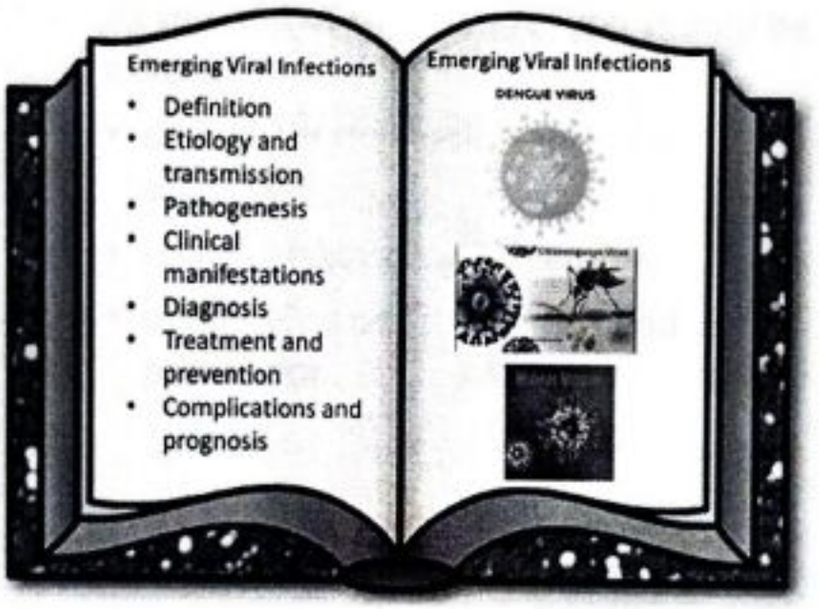
REFERENCES

№	Source	Type	Content / Use	Year
1	WHO. NTD Roadmap 2021–2030	WHO strategy	Global NTD elimination targets	2021
2	WHO. Schistosomiasis Factsheet	WHO guideline	Praziquantel, MDA, prevention	2023
3	WHO. Lymphatic Filariasis Factsheet	WHO guideline	GPELF program, treatment	2023
4	Manson's Tropical Diseases, 23rd ed.	Textbook	Comprehensive helminthic chapters	2019
5	CDC. Parasitic Diseases — Helminths	CDC resource	All helminthic diseases	2023
6	WHO. Echinococcosis Factsheet	WHO guideline	PAIR technique, prevention	2023

Lecture title:

Emerging Viral Infections: Dengue, Chikungunya and Nipah Virus Infection

Lecture outline



At the end of this lecture, you should be able to:

- describe transmission and epidemiology,
- recognize key clinical features,
- understand basic diagnosis and prevention.

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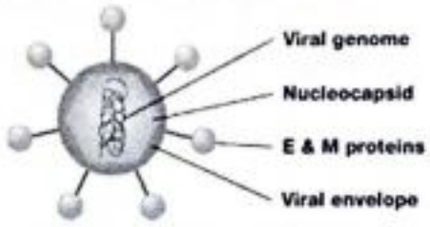
Etiology

- Dengue fever is caused by any of the 4 distinct serotypes (DENV-1 to DENV-4) of single-stranded RNA viruses belonging to the genus *Flavivirus*. Infection by one serotype confers lifelong immunity to that serotype but not to others.



Epidemiology

- **Dengue fever** is endemic in over 100 countries, with recurrent epidemics across the Americas, Asia, Africa, and Australia.
- Transmission cycle: **Human–mosquito–human**
- **Mosquito: Aedes aegypti** and **Aedes albopictus**
- Predominantly **urban** transmission
- Mosquitoes are **daytime biters**
- **Rare transmission routes:**
- blood transfusion
- perinatal transmission
- breastfeeding
- organ transplantation

Epidemiology

- Dengue transmission occurs as:
- **Epidemic dengue** – caused by a single viral serotype, affecting all ages, with low risk of severe disease
- **Hyperendemic dengue** – multiple serotypes circulate, mainly affecting children and associated with a higher risk of **dengue hemorrhagic fever**

Pathogenesis of Dengue

- Virus enters the skin after a **mosquito bite**
- Initial infection of **macrophages and dendritic cells**
- Viral replication → spread via **lymphatic system and bloodstream (viremia)**
- Activation of the immune response with release of **cytokines**
- In severe dengue:
  - **Antibody-dependent enhancement (ADE)** during secondary infection
  - Increased **capillary permeability**
  - Plasma leakage → **hypovolemia and shock**
  - **Thrombocytopenia** and coagulation disturbances → bleeding

Clinical Presentation

- Up to **75% of infections are asymptomatic**
- Symptomatic disease ranges from **mild dengue fever** to **severe dengue**
- Severe dengue develops in **0.5–5%** of cases
- Higher risk of severe disease in children
- **Incubation period:** 4–7 days
- **Duration of symptoms:** 3–10 days

Clinical Course: Phases of Dengue Fever

- **Febrile phase**
- **Critical phase**
- **Recovery phase**

Phases of Dengue Fever

Phase	Key features	Main risks
Febrile phase (2–7 days)	High fever (up to 40 °C), headache, myalgia, arthralgia, nausea/vomiting, facial flushing, rash (macular or maculopapular), sometimes biphasic fever	Dehydration, misdiagnosis
Critical phase (days 3–7, 1–2 days)	Defervescence, ↑ capillary permeability, thrombocytopenia, ↑ hematocrit, leukopenia	Shock, bleeding, organ failure, DIC
Recovery phase (2–3 days)	Reabsorption of fluids, clinical improvement, bradycardia	Fluid overload (if excessive IV therapy)

Glossary of Tropical Infections

Amoebiasis — an intestinal or extraintestinal infection caused by *Entamoeba histolytica*, characterized by dysentery and liver abscesses.

Anopheles mosquito — a genus of mosquitoes responsible for the transmission of malaria.

Antiparasitic drugs — medications used to treat infections caused by parasites (e.g., protozoa, helminths).

Biological vector — a living organism that transmits pathogens and in which the pathogen develops or multiplies (e.g., mosquito, tick).

Chikungunya — a viral disease transmitted by *Aedes* mosquitoes, causing fever and severe joint pain.

Clinical manifestation — signs and symptoms observed in a patient with a disease.

Co-infection — simultaneous infection with two or more pathogens.

Dengue fever — a mosquito-borne viral infection causing high fever, rash, and hemorrhagic manifestations.

Differential diagnosis — the process of distinguishing a disease from others with similar symptoms.

Ebola virus disease (EVD) — a severe hemorrhagic fever with high mortality, caused by Ebola virus.

Endemic disease — a disease regularly found among particular people or in a certain area.

Epidemiology — the study of distribution and determinants of diseases in populations.

Filariasis — a parasitic disease caused by filarial worms, transmitted by mosquitoes, leading to lymphatic damage.

Fever pattern — the characteristic variation in body temperature over time in infectious diseases.

Global health — the field of study and practice focused on improving health worldwide.

Hemorrhagic fever — a group of viral infections characterized by fever and bleeding disorders.

Host — an organism that harbors a pathogen.

Incubation period — the time between exposure to a pathogen and onset of symptoms.

Infectious process — the interaction between a pathogen and the host organism.

Japanese encephalitis — a mosquito-borne viral infection affecting the central nervous system.

Leishmaniasis — a parasitic disease transmitted by sandflies, affecting skin, mucosa, or internal organs.

Malaria — a protozoal infection caused by *Plasmodium* species and transmitted by *Anopheles* mosquitoes.

Morbidity — the incidence or prevalence of a disease in a population.

Mortality — the number of deaths caused by a disease.

Neglected tropical diseases (NTDs) — a group of infectious diseases prevalent in tropical regions, often affecting low-income populations.

One Health — an approach recognizing the interconnectedness of human, animal, and environmental health.

Pathogen — a microorganism that causes disease.

Pathogenesis — the mechanism by which a disease develops.

Parasitic infection — infection caused by parasites such as protozoa, helminths, or ectoparasites.

PCR (Polymerase Chain Reaction) — a molecular diagnostic method used to detect genetic material of pathogens.

Rickettsiosis — a group of diseases caused by *Rickettsia* bacteria, transmitted by arthropods.

Schistosomiasis — a parasitic disease caused by trematodes, transmitted through contaminated water.

Serology — laboratory study of blood serum to detect antibodies or antigens.

Tropical disease — a disease that occurs primarily in tropical and subtropical regions.

Trypanosomiasis — a parasitic disease transmitted by insects (e.g., tsetse fly), affecting blood and nervous system.

Vector-borne disease — an infection transmitted by vectors such as mosquitoes, ticks, or flies.

Viremia — the presence of viruses in the bloodstream.

Zoonosis — an infectious disease transmitted from animals to humans.

Glossary of Infectious Diseases

Acute infection – A rapid onset infection with relatively short duration.
Antibiotic resistance – The ability of bacteria to resist the effects of antibiotics.
Antibody – A protein produced by the immune system to neutralize pathogens.
Antigen – A molecule or part of a pathogen that triggers an immune response.
Antiretroviral therapy (ART) – Treatment for HIV infection using a combination of drugs that suppress viral replication.
Bacteremia – The presence of bacteria in the bloodstream.
Carrier – An individual who harbors a pathogen without showing symptoms but can transmit the infection.
Chronic infection – A long-lasting infection, often persisting for months or years.
Contagious disease – An infectious disease that is easily transmitted from person to person.
Differential diagnosis – A process of distinguishing a disease from others with similar symptoms.
Endemic – The constant presence of a disease in a particular geographic area.
Epidemic – A sudden increase in the number of cases of a disease above normal expectations.
Etiology – The cause or origin of a disease.
Fomite – An inanimate object capable of transmitting infectious agents (e.g., doorknob, bedding).
Host – An organism that harbors a pathogen.
Immunity – The body's ability to resist infection, either through natural exposure or vaccination.
Incubation period – The time interval between exposure to an infection and the onset of symptoms.
Nosocomial infection – An infection acquired in a hospital or healthcare setting.
Opportunistic infection – An infection caused by pathogens that take advantage of a weakened immune system.
Outbreak – The occurrence of cases of a disease in excess of what is normally expected in a defined area.
Pandemic – An epidemic that spreads across multiple countries or continents.
Pathogenesis – The process by which an infection leads to disease.
Pathogen – A microorganism that can cause disease (virus, bacterium, fungus, parasite).
Prophylaxis – Preventive treatment to protect against infection.
Reservoir – The natural habitat where a pathogen normally lives and multiplies.
Sepsis – A life-threatening condition caused by the body's response to infection, leading to organ dysfunction.
Superinfection – A new infection occurring during treatment of a primary infection.
Vector – A living organism (e.g., mosquito, tick) that transmits pathogens between hosts.
Virulence – The degree of pathogenicity of a microorganism.
Zoonosis – An infectious disease that can be transmitted from animals to humans.

Typhoid fever – A systemic infection caused by *Salmonella Typhi*, characterized by prolonged fever, abdominal pain, and rose spots.
Paratyphoid fever – Similar to typhoid fever but caused by *Salmonella Paratyphi A, B, or C.*
Enterotoxin – A toxin produced by bacteria that targets the intestines, leading to diarrhea.
Shigellosis – An acute bacterial intestinal infection caused by *Shigella* spp., often presenting with bloody diarrhea.
Cholera – Severe diarrheal disease caused by *Vibrio cholerae*, leading to dehydration and electrolyte imbalance.
Rotavirus infection – Viral gastroenteritis in children, presenting with vomiting and watery diarrhea.

Norovirus – Highly contagious viral gastroenteritis, causing outbreaks in closed communities.
Botulism – A severe neuroparalytic disease caused by *Clostridium botulinum* toxins.
Foodborne infection – Illness caused by consuming food contaminated with pathogens.

Hepatitis A – Acute liver infection transmitted via the fecal-oral route.
Hepatitis E – Waterborne viral hepatitis, dangerous in pregnant women.
Hepatitis B virus (HBV) – DNA virus transmitted parenterally; can cause chronic infection and liver cancer.
Hepatitis C virus (HCV) – RNA virus with high genetic variability, major cause of chronic hepatitis and cirrhosis.
Hepatitis D virus (HDV) – Defective virus that requires HBV for replication.
Seroconversion – The development of detectable antibodies in the blood against an infection.
HIV (Human Immunodeficiency Virus) – Retrovirus attacking CD4+ T lymphocytes, leading to AIDS.
AIDS (Acquired Immunodeficiency Syndrome) – The late stage of HIV infection characterized by opportunistic infections and malignancies.
Opportunistic infections – Infections caused by normally harmless organisms in immunocompromised hosts (e.g., *Pneumocystis jirovecii* pneumonia, tuberculosis).

Exanthem – A widespread skin eruption associated with viral infection.
Measles – Highly contagious viral infection with fever, cough, Koplik spots, and maculopapular rash.
Rubella (German measles) – Viral infection with rash, mild fever, and risk of congenital rubella syndrome in pregnancy.
Varicella (Chickenpox) – Primary infection with varicella-zoster virus, characterized by vesicular rash.
Roseola infantum – Childhood viral illness with high fever followed by a sudden rash.
Epstein-Barr Virus (EBV) – Virus causing infectious mononucleosis, associated with lymphoproliferative disorders.
Monospot test – A rapid test for heterophile antibodies used in EBV diagnosis.**Scarlet fever** – Infection caused by *Streptococcus pyogenes* producing erythrogenic toxin, leading to fever, sore throat, and sandpaper-like rash.
Diphtheria – Acute infection caused by *Corynebacterium diphtheriae*, producing pseudomembrane in the throat and systemic toxin effects.
Pseudomembrane – A grayish layer composed of fibrin, dead cells, and bacteria, typical for diphtheria.
Antitoxin – Antibody preparation used for neutralizing bacterial toxins (e.g., diphtheria antitoxin).
Meningococcal infection – Infection caused by *Neisseria meningitidis*, manifesting as meningitis or meningococcemia.
Meningococcemia – A severe bloodstream infection with meningococci, presenting with petechial rash, shock, and high mortality.
Petechiae – Small red or purple skin spots caused by minor hemorrhages.
Waterhouse–Friderichsen syndrome – Adrenal gland failure due to meningococcal septicemia.