

Worldwide e-Learning Course on Malaria Microscopy

Course Information Sheet

Improving malaria diagnostics

Introduction

Malaria remains a major global public health problem worldwide with 3.2 billion people at risk of infection annually. Malaria is a leading cause of illness and death in many low-income countries. Quality malaria diagnosis and treatment, and effective use of resources, are major pillars in achieving the ultimate goal of malaria elimination. The World Health Organization (WHO) currently recommends confirmation before treatment in all cases of malaria, including children less than 5 years of age. Microscopy-based diagnosis of malaria remains the accepted clinical standard for parasite detection, species identification and quantitation, severe and complicated malaria management, assessment of therapeutic efficacy of anti-malarial drugs, and detection of other blood parasites causing fever.

The Worldwide e-Learning Course on Malaria Microscopy is a self-instructional learning programme for those wishing to strengthen their skills in the laboratory diagnosis of malaria. The course is not intended to replace formal classroom instruction, but provides basic information and practice for learners when classroom instruction is not available, and helps to prepare for classroom-based courses. The course utilises virtual microscopy consistent with WHO standards and was developed by representatives from WHO AFRO, Global Good Fund/Intellectual Ventures Laboratory (GG/IVL), Ministry of Health Kenya, University of Nairobi, USAMRD-K, the Australian Army Malaria Institute, Amref Health Africa in Kenya and Tanzania, a consultant parasitologist (retired CDC), the Universidad Peruana Cayetano Heredia (UPCH) Peru, and the Asian Collaborative Training Network for Malaria (ACTMalaria) in the Philippines.

Goal

To promote quality malaria management and elimination strategies through accurate microscopy-based malaria diagnostic services.

Target users

The course is open to any person wishing to improve their skills in malaria microscopy. The course is appropriate for participants in both low- and high-income country settings in any part of the world. Users who are most likely to benefit from the course include:

- Trained microscopists wishing to improve their malaria diagnostic skills
- Laboratory staff performing malaria microscopy who would benefit from self-directed refresher training
- Microscopists preparing for future competence assessments in malaria microscopy

The course can be taken in the following ways:

- Working individually
- Working jointly with a colleague or in a group
- Providing the course as a training tool by national malaria control programmes or other institutions

Content

The course materials are provided on a USB disk for off-line use. The course is structured in five (5) modules, with each module divided into a number of units and sub-topics. The modules have detailed content of systematic procedures for malaria diagnosis through microscopy, supported by images and videos for practical exercises. The course include a large library of virtual slides including microscopic images of malaria parasite species and different parasite densities, as well as other blood pathogens and abnormalities. The virtual microscope simulates real microscopy, including scanning and focusing slides at high resolution. The course can be used for self-instruction, as a refresher course or as an instructor's manual, and includes suggestions for further learning and reference materials. Individual modules can be selected as needed, or the complete course can be taken from beginning to end. The course has automatically marked pre- and post-tests, and each module ends with a quiz to assess learning. Internet access is required only for registration, and application and submission of results for the Final Assessment.

Participants wishing to take the Final Assessment must apply to the course organisers for a code to access the Final Assessment questions encrypted within the USB. The Final Assessment is graded on theory, parasite detection, species identification and parasite counting on virtual slides. A Certificate of Achievement is awarded to those who achieve a grade A in all test components; a Certificate of Participation is provided to other participants. A transcript detailing performance is provided for every completed Final Assessment. The Final Assessment can be taken as many times as needed. Assistance with any aspect of the course is available from the help desk.

The overall course structure is shown in the table below and indicates the approximate times needed to complete each section, as a guide. Participants are expected to take varying amounts of time to complete the course, depending on their experience and the time available.

Module	Units	Topics	Suggested time to complete
Pre-test			2 hours
Module 1		Introduction to malaria	4 hours
	Unit 1.1	Overview of the global malaria situation	
	Unit 1.2	Life cycle of the malaria parasite	
Module 2		Blood specimen processing	8 hours
	Unit 2.1	Collection of blood specimens	
	Unit 2.2	Preparation of thick and thin blood films	
	Unit 2.3	Preparation of stains	
	Unit 2.4	Staining procedures	
Module 3		Blood film examination	14 hours
	Unit 3.1	Blood components	
	Unit 3.2	Malaria parasite detection	
	Unit 3.3	Malaria parasite species identification	
	Unit 3.4	Malaria parasite quantitation	
	Unit 3.5	Non-malaria pathogens in blood films	
	Unit 3.6	Commonly found artefacts in blood films	
	Unit 3.7	Reporting blood film examination results	
Module 4		Other laboratory diagnostic methods for malaria	4 hours
	Unit 4.1	Processes and limitations for use of RDTs	
	Unit 4.2	Other methods used in malaria diagnosis	
Module 5		Laboratory Quality Management Systems	6 hours
	Unit 5.1	Quality Management System (QMS) elements	
	Unit 5.2	Types and sources of errors	
Post-test			2 hours
5 modules	17 units		40 hours

Course fees

Costs are based on a tiered system per country economic status.

Cost in USD*	LIC	LMIC	UMIC	HIC
E-Learning course (individuals)	40	60	300	450
E-Learning course (institutions)	2,000	3,000	7,500	10,000

(*) Total costs **do not** include shipping of USBs.

Institutions are provided with a broad subscription of up to 100 USBs for a flat fee, depending on the country's economic status. Each USB can accommodate up to 5 accounts for individually purchased USBs, and up to 2 accounts for institutionally purchased USBs. Accounts on the USBs are accessed through use of individual passwords.

For further details about the course and to request for the course materials, please contact the following:

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