

EDITED BY:
FRANÇOISE PORTAELS
PAUL JOHNSON
WAYNE M. MEYERS

Buruli Ulcer



Diagnosis of
Mycobacterium
ulcerans disease

A MANUAL FOR HEALTH CARE PROVIDERS



World Health Organization

This manual was published thanks to financial support from:



Raoul Follereau

The Association Française Raoul Follereau (AFRF), France is an NGO dedicated to leprosy control in 31 countries worldwide. It also supports six research projects on leprosy, including the genome sequencing of *Mycobacterium leprae*. Long before the first International Conference on Buruli Ulcer Control and Research, Yamoussoukro, Côte d'Ivoire, 1998, AFRF had taken up the new challenge of the health and social problems caused by Buruli ulcer, working in Benin and Côte d'Ivoire since 1996. The Association also provides financial assistance to research activities on the genome sequencing of *Mycobacterium ulcerans* and on the drug treatment of the disease. It is now considering supporting other countries, starting with Ghana. AFRF is committed to mobilizing the international support needed to meet the challenges posed by Buruli ulcer. For more information, visit the AFRF website: <http://www.raoul-follereau.org>



ANESVAD, Spain is an NGO that has been working against leprosy and implementing health, social and educational projects in 28 of the poorest developing countries for over 30 years. Currently it counts on the support of over 135 000 partners and collaborators in Spain. It has recently begun work on Buruli ulcer in Côte d'Ivoire, carrying out programmes to detect the disease at an early stage and undertaking prevention, surgical treatment, training of specialized medical staff and social awareness campaigns, with the aim of limiting the impact of Buruli ulcer. For more information, visit the ANESVAD website: <http://www.anesvad.org>



Médecins Sans Frontières (MSF) is an international humanitarian aid organization that provides emergency medical assistance to populations in danger in more than 80 countries. MSF Luxembourg has been involved in Buruli ulcer control activities in Benin since 1997. MSF has upgraded the Lalo Health Centre with surgical and laboratory facilities to improve the care of patients. Apart from surgical activities, other key activities include health education in affected communities, case-finding and training of health care providers, teachers and traditional healers. In terms of Buruli ulcer research, MSF is collaborating with the Institute of Tropical Medicine, Antwerp, Belgium. For more information, visit the MSF Luxembourg's website at: <http://www.msf.lu>



The Nippon Foundation, Japan is a private grant-making foundation whose activities cover social welfare, public health, volunteer support and overseas assistance. Since 1975 it has been working through the Sasakawa Memorial Health Foundation to aid WHO in its fight to eliminate leprosy. Starting in 1998, The Nippon Foundation also began providing financial support to the WHO Global Buruli Ulcer Initiative. The Foundation, in tandem with WHO and several academic institutions, is currently exploring options for improved surgical management of the disease. Finally, it is also collaborating with WHO, AFRF and other partners to find a drug treatment for Buruli ulcer. For more information, visit The Nippon Foundation's website at: <http://www.nippon-foundation.or.jp>

Buruli Ulcer

A MANUAL FOR HEALTH CARE PROVIDERS

EDITED BY:

PROFESSOR FRANÇOISE PORTAELS
Department of Microbiology
Institute of Tropical Medicine
Antwerp, Belgium

ASSOCIATE PROFESSOR PAUL JOHNSON
Department of Infectious Diseases
Austin and Repatriation Medical Centre
Heidelberg, Melbourne, Australia

DOCTOR WAYNE M. MEYERS
Division of Microbiology
Armed Forces Institute of Pathology
Washington, DC, United States of America

Diagnosis of
Mycobacterium
ulcerans disease



World Health Organization

Acknowledgements

With special thanks to Rosemary Bell, France, and John Hayman, Monash University, Australia.

© **World Health Organization, 2001**

This document is not a formal publication of the World Health Organization (WHO), and all rights are reserved by the Organization. The document may, however, be freely reviewed, abstracted, reproduced or translated, in part or in whole, but not for sale or for use in conjunction with commercial purposes. The views expressed in documents by named authors are solely the responsibility of those authors.

Design: Gilles Lasseigne – Layout: Bruno Duret

Contents

Preface	1
Illustrations	2
Introduction	3
Chapter 1. Clinical diagnosis	7
Chapter 2. Biosafety and record-keeping in the laboratory	15
Chapter 3. Collection and transport of clinical specimens	19
Chapter 4. Secondary bacterial infection in <i>M. ulcerans</i> disease	23
Chapter 5. Microbiological methods	27
Chapter 6. Histopathological methods	37
Annex 1. Flow chart for the laboratory diagnosis of <i>M. ulcerans</i> disease	48
Annex 2. Laboratory request form	49
Annex 3. Laboratory report form	51
Annex 4. Preparation of culture media	52
Annex 5. Microbiological staining techniques	54
Annex 6. Histopathological staining techniques	59
Annex 7. Decontamination methods	68
Annex 8. <i>M. ulcerans</i> culture with BACTEC 460 TB instrument	71
Annex 9. Biochemical and culture tests used to identify mycobacteria	72
Annex 10. Polymerase chain reaction (PCR) protocol	78
Annex 11. Manufacturers' addresses	84
Annex 12. Work of WHO on Buruli ulcer	85
Annex 13. Some research institutions involved in Buruli ulcer activities	87

Annex 14. Some nongovernmental organizations and others involved in Buruli ulcer activities	88
Annex 15. Members of the WHO Advisory Group on Buruli ulcer	89
Annex 16. Suggested reading	90
Table 1 Differential diagnoses of various forms of Buruli ulcer	
Table 2 Disinfectants recommended for use in laboratories studying <i>M. ulcerans</i>	
Table 3 Specimen collection and laboratory methods for each care-level	
Table 4 Phenotypic characteristics of <i>M. ulcerans</i> and related species	
Table 5 Characteristics of the different geographical subgroups of <i>M. ulcerans</i>	
Table 6 <i>In vitro</i> susceptibility of <i>M. ulcerans</i> to antimycobacterial drugs	
Table 7 Preparation of inhibitory agents	
Table 8 Urease activity	

Contributors

Prof. Ohene Adjei, Department of Microbiology, School of Medical Sciences, University of Science and Technology, Kumasi, Ghana / **Prof. Bernard Carbonnelle**, Laboratoire de Bactériologie, Centre Hospitalier Universitaire d'Angers, Angers, France / **Prof. Patience Mensah**, Bacteriology Unit, Noguchi Memorial Institute for Medical Research, University of Ghana, Accra, Ghana / **A/Prof. Paul Johnson**, Department of Infectious Diseases, Austin and Repatriation Medical Centre, Heidelberg, Melbourne, Australia / **Dr Henri Kouakou**, Institute Raoul Follereau, Adzope, Côte d'Ivoire / **Dr Wayne M. Meyers**, Division of Microbiology, Armed Forces Institute of Pathology, Washington, DC, USA / **Prof. Françoise Portaels**, Department of Microbiology, Institute of Tropical Medicine, Antwerp, Belgium / **Dr Kingsley Asiedu**, Communicable Diseases Control, Prevention and Eradication, World Health Organization, Geneva, Switzerland

Preface

This manual is to assist health care providers and laboratory scientists to diagnose *Mycobacterium ulcerans* disease (Buruli ulcer). The manual aims to achieve a better understanding of the clinical presentation and its diagnosis. The methods described are tailored to various levels of care and available resources to improve the diagnosis and surveillance of the disease.

Please note: This manual is not intended to serve as a standard of laboratory methods. It is not a replacement for textbooks on laboratory work. Adherence to it will not ensure a successful outcome in every case, nor should it be construed as including all proper methods of laboratory diagnosis or excluding other acceptable methods aimed at the same results. Ultimate judgement regarding a particular method must be made by the health care provider or laboratory scientist in the light of the clinical findings in the patient and the available options for diagnosis.

Illustrations

- Fig. 1 World map showing distribution of Buruli ulcer (WHO)
- Fig. 2 Papule (John Hayman)
- Fig. 3 Nodule (Mark Evans)
- Fig. 4 Plaque (Mark Evans)
- Fig. 5 Oedematous forms (May Smith and Kingsley Asiedu)
- Fig. 6 Ulcers (May Smith and Mark Evans)
- Fig. 7 Osteomyelitis (Giovanni Batista Priuli)
- Fig. 8 Contractures (Marcel Crozet)
- Fig. 9 Hypertrophic scar (Pius Agbenorku)
- Fig. 10 Squamous cell carcinoma following Buruli ulcer (Mark Evans)
- Fig. 11 Differential diagnosis (Wayne Meyers)
- Fig. 12 Containers for specimens (Paul Johnson)
- Fig. 13 Swabbing technique (May Smith)
- Fig. 14 Mouse tail inoculation (Bernard Carbonnelle)
- Fig. 15 Culture characteristics of African and Australian *M. ulcerans* strains (Françoise Portaels)
- Fig. 16 Polymerase chain reaction results (Paul Johnson)
- Fig. 17 Section of surgically resected nodule of *M. ulcerans* disease (John Hayman)
- Fig. 18 Microscopic section of a nodule (AFIP)
- Fig. 19 Skin and subcutaneous tissue from centre of a non-ulcerated lesion (AFIP courtesy Wayne Meyers)
- Fig. 20 Necrotic base of Buruli ulcer (AFIP courtesy Wayne Meyers)
- Fig. 21 Severe vasculitis in subcutaneous tissue lesion
- Fig. 28 Early healing of a Buruli ulcer in the organizing phase (AFIP Courtesy Wayne Meyers)
- Fig. 29 Delayed hypersensitivity granuloma in healing Buruli ulcer (AFIP)
- Fig. 30 Advanced stage of healing Buruli ulcer (AFIP courtesy Wayne Meyers)
- Fig. 31 Lymphadenopathy in Buruli ulcer (AFIP courtesy Wayne Meyers)
- Fig. 32 Necrotic lymphadenitis in a lymph node proximal to a Buruli ulcer (AFIP courtesy Wayne Meyers)
- Fig. 33 X-ray of the leg showing destruction of the bone (Giovanni Battista Priuli)
- Fig. 34 Osteomyelitis of tibia showing necrosis of the marrow (AFIP courtesy Wayne Meyers)
- Fig. 35 Osteomyelitis of tibia with masses of AFB in necrotic marrow (AFIP courtesy Wayne Meyers)
- Fig. 36 Osteomyelitis of tibia showing necrosis of marrow (AFIP courtesy Wayne Meyers)
- Fig. 37 Ziehl-Neelsen stained smear from a Buruli ulcer (Françoise Portaels)
- Fig. 38 Fluorochrome stained smear showing AFB (Wellcome Trust courtesy of AM Emmerson)
- Fig. 39 Section of tissue from a Buruli ulcer patient stained by the Harris' hematoxylin-eosin method showing panniculitis (AFIP courtesy Wayne Meyers)
- Fig. 40 Section of a lymph node from a Buruli ulcer patient

预览已结束，完整报告链接和二维码如下：

https://www.yunbaogao.cn/report/index/report?reportId=5_30385

